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DISEASES CAUSED BY BACTERIA AND FUNGI

*BRUSCHETTINI, G. (1942). Sulla differenzazione degli stafilococchi. **[Differentiation of Staphylococci].**—*Ann. Igiene (sper.).* **52.** 249–260. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **143.** 137]. **1428a**

B. investigated 35 pathogenic and 15 saprophytic strains of staphylococci, and concluded that the criteria of virulence were coagulase production and haemolysin production.—A. R. JENNINGS.

EDWARD, D. G. ff. (1944). **Haemolytic Streptococci in the Dust of Hospital Wards, and their Relationship to Infection. A Report to the Medical Research Council.**—*J. Hyg., Camb.* **43.** 256–265. [Author's summary copied *verbatim*]. **1429a**

1. A weekly examination of haemolytic streptococci was made of the dust of two hospital wards; observations lasted in each ward for about six months. The wards chosen were a combined ear, nose and throat and eye ward used for adult patients, and a children's ward.

2. It was found that on an average for the whole period the dust of the former ward contained 300,000 haemolytic streptococci per gram and the dust of the latter 250,000 per gram.

3. Representative colonies of haemolytic streptococci grown from each sample of dust were examined serologically to determine their group. About 33% of those isolated from the E.N.T. Eye ward were group A and about 80% of those from the children's ward.

4. In order to determine the relationship of the streptococci in the dust to streptococcal infection among patients and staff, throat swabs and swabs from septic lesions were regularly examined.

5. In the children's ward 27·8% of 270 patients were found to be infected with haemolytic streptococci either on admission or at some time during their stay in hospital. The incidence of infection acquired in hospital was more than 12·2%. About two-thirds of these infections were latent.

6. Group A streptococci isolated from the dust and swabs were identified serologically according to type. It was noted that the occurrence of a particular type in the dust often resulted from the presence of one or more infected persons in the ward.

7. It was, however, frequently noted that a particular type made its first appearance in the dust when it could not be cultured from any of the swabs. It is possible that these strains were introduced to the ward by visitors, such as patients' relatives and friends or patients from other wards coming for septic dressings.

8. No conclusive example of a hospital cross-infection conveyed by dust was noted.

*ZOLLIKOFER, E. (1941). Zum Nachweis des gelben Galtes. **[Studies on Mastitis].**—*Schweiz. Milchztg.* **67.** No. 11. 45. [Abst. in *Biol. Abstr.* Sect. F. **16.** No. 7. 30, copied *verbatim.* Signed: J. F. CONE]. **1430a**

On the basis of the catalase test, the chloride titration, the measurement of sediment in a centrifuged sample and the microscopic examination of the sediment for streptococci and leucocytes, 800 individual quarter samples of milk were grouped into 5 groups. Further studies were made on each group by the cultural method of Steck. Of 94 samples in Group I (mastitis), 93·6% showed typical or slightly atypical infections by cultural methods. In the remaining 6·4% no growth occurred. Of 117 samples in Group II (mastitis suspected), 78·6% were likewise culturally positive. In Groups III and IV (no mastitis, but other udder inflammation), 28·8 and 39·1% respectively were positive. In the negative Group V, 16·4% showed typical or slightly atypical infections by cultural methods.

WARD, A. H., WHITTLESTON, W. G., HOPKIRK, C. S. M., & FILMER, J. F. (1942). **To Strip, or Not to Strip.**—*N.Z. J. Agric.* **64.** 85–93. **1431a**

In an investigation embracing 28 herds in which stripping had been abandoned for periods ranging from 1–25 years, no evidence was discovered to indicate that abandonment of the practice had caused any material rise or fall in production, nor was it found that any increase in mastitis had been caused.—M. B. BUDDLE.

*CONTINI, T. (1942). Sul comportamento delle soluzioni di ferro in presenza di germi capsulati. **[Behaviour of Iron Solutions in Presence of Capsulated Bacilli].**—*Igiene mod.* **35.** 143–150. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **142.** 482]. **1432a**

Studies on anthrax-infected blood showed that in the presence of an iron salt in solution the bacillus increases in size and that this increase is greater with capsulated than with non-capsulated bacilli. The capsule of the anthrax bacillus and the surface of the "iron-bacteria" both have this property of swelling in the presence of iron salts.—JOHN FRANCIS.

SCHWEIGER, L. B., TRAINER, D., & EVELETH, D. F. (1943). **Isolations of Bacillus Subtilis from Actinobacillosis-Like Lesions in Cattle and Sheep.**—*Amer. J. vet. Res.* **4.** 127–133. **1433a**

The authors state that in the Ozark area of Arkansas and its environs there are many unthrifty cattle and sheep. The condition has been variously attributed to Johne's disease, necrobacillosis, actinobacillosis, and parasitism. In some herds the appearance of small abscesses, usually on the jaw, is common. The authors isolated eight strains of an organism classified as *Bacillus subtilis* from five mandibular abscesses and one liver abscess in cattle, and one liver abscess, one calcified lung lesion, and a mesenteric lymph node in sheep.

The morphology, cultural, and biochemical characteristics of the organism are described. High-titre antiserum was produced in rabbits by the intravenous injection of each strain. The pathogenicity of the organism for the g. pig, rabbit, rat, calf, and sheep is described. The authors suggest that *B. subtilis* may on occasion be pathogenic and that predisposing factors such as parasitic punctures or the passage of foreign bodies from the reticulum to the liver may facilitate its invasion and explain its presence in abscesses in internal organs, while bruising of the mandibular tissues may facilitate invasion in that region. Differential diagnosis is discussed and iodine therapy is suggested as being specific in the treatment of uncomplicated cases.
—H. I. FIELD.

GRIFFITH, A. S., & MUNRO, W. T. (1944). **Human Pulmonary Tuberculosis of Bovine Origin in Great Britain.**—*J. Hyg., Camb.* **43.** 229–240. **1434a**

This article provides a useful summary of the distribution and extent of human pulmonary TB. due to the bovine type bacillus in the British Isles. Many of the details have been published elsewhere. A table is given showing that in Scotland 2,769 cases were examined with an incidence of 160 bovine infections (5·7%): the corresponding figures for England, Wales and Eire were 4,194 with an incidence of 81 (1·9%).

An analysis of the 241 bovine type cases (including 14 from which autopsy material was obtained) showed that 70 gave clinical or P.M. evidence of previous alimentary infection. As most of the persons had consumed large quantities of raw milk in childhood, it is suggested that the avoidance of the consumption of infected milk might lead to the disappearance of this form of pulmonary TB.

A searching enquiry into environmental conditions failed to reveal any evidence of transmission of the bovine type from man to man or from cattle to man by the inhalation of infected particles.—R. E. GLOVER.

JENSEN, K. A., LESTER, V., & TOLDERLUND, K. (1940). **The Frequency of Bovine Infection among Tuberculosis Patients in Denmark.**—*Acta tuberc. scand.* **14.** 125–157. [In English]. **1435a**

In order to determine the distribution of bovine type TB. in man in Denmark, typing of all routine material received at the State Serum Institute, Copenhagen, over a period of five years was undertaken. Of 5,476 strains of tubercle bacilli, 4,831 were human type, 644 bovine, and one avian.

Generally, it appeared that in districts with much TB. among cattle, the incidence of bovine infection among the human population was also high.

There is a marked difference in the incidence of bovine infection among persons living in the town and in the country. This difference was present in all age groups. Pulmonary TB. due to bovine type in the towns occurred almost exclusively in children under 15 years, whereas in rural districts it was almost as frequent in the age group 15–30 years as in the group 0–15 years.

It is suggested that inhalation is a frequent route of transmission of bovine infection to the human subject. This suggestion is made in view of the observations that by far the largest number of cases of bovine pulmonary TB. occur in adults in the country, that in them the course of the disease is much more rapid and serious than would be expected from an alimentary infection, and that 15 cases of primary conjunctival TB. caused by the bovine type have been demonstrated in adult country people engaged in milking cattle.

It is considered that, because of the risks of inhalation infection, a cowshed in which tuberculous cows are maintained involves the same risks of infection for the human subject as does a TB. sanatorium. From this it is deduced that TB. in man cannot be eradicated until it has been eliminated from cattle; *vice versa*, while bovine TB. exists in man TB.-free stock cannot be regarded as safe from reinfection. Indeed, it appears certain that an exchange of bovine type tubercle bacilli may frequently occur between man and cattle and *vice versa*. The combating of the disease demands, therefore, intimate and energetic co-operation between the physician and the veterinarian.—D. D. OGILVIE.

*LEMBKE, A., RUSKA, H., & CHRISTOPHERSEN, J. (1940). Vergleichende mikroskopische Beobachtungen an den Erregern der Tuberkulose. **[Comparative Microscopic and Ultramicroscopic Observations on Tubercle Bacilli].**—*Klin. Wschr.* 217–220. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* March 28th. 160. (1941)]. **1436a**

Studies were carried out with the fluorescence microscope and with ordinary and dark-ground illumination, as well as with the ultramicroscope. A strain of the avian type of tubercle bacillus was used, but a few observations were made on bacilli of the human and bovine types. With the ultramicroscope granules of 300–350 mμ and microgranules 20–50 mμ in diameter were observed. These microgranules were contained in vacuoles. Slight hydrolysis produced no marked change in the protoplasm. Ether extraction removed the outer lipoid layer of the bacillus and also produced changes in the granules.—JOHN FRANCIS.

KALLMANN, F. J., & REISNER, D. (1943). **Twin Studies on the Significance of Genetic Factors in Tuberculosis.**—*Amer. Rev. Tuberc.* **47.** 549–574. [Spanish summary]. **1437a**

The authors describe an important investigation in which they attempt by statistical means to assess the possible significance of genetic factors in the development of TB. in the human subject. The method of study used was a comparison of unselected groups of monozygotic and dizygotic twins, combined with a family study including the other sibship groups and the marriage partners of the twin index cases. The main objective of this latter procedure was to obtain for comparison a sufficient number of genetically dissimilar relationship groups reared under comparable environmental conditions. The material used for analysis of the frequency of TB. among the relatives of twin index cases affected by reinfection TB. consisted of 308 complete families, with 308 twin pairs (78 monozygotic and 230 dizygotic) and a total of 2,534 individuals. Comparison of the morbidity rates revealed that the chance of developing TB. increased in strict proportion to the degree of blood relationship to a TB. index case. Consistent differences in TB. morbidity were found among the various sibship groups; analysis of the data showed that these differences could not be adequately explained on the basis of a simple correlation between closeness of blood relationship and increasing similarity in environment with correspondingly intensified opportunity for infection. The authors conclude from the results of their analysis that resistance to TB. is modified by a hereditary constitutional mechanism which seems to be multifactorial in its genetic nature. The paper includes a detailed discussion of the genetic mechanisms which may play a part in the development of the disease.—N. J. SCORGIE.

AULT, C. N. (1942). Un caso de enfermedad de johne en el lanar. **[Johne's Disease in a Sheep in the Argentine].**—*Rev. Med. vet., B. Aires.* **24.** 401–403. **1438a**

This is stated to be the first reported case of Johne's

disease in a sheep in the Argentine. The symptoms and P.M. findings are described. *Mycobacterium johnei* was demonstrated in the lesions.

FISCHEL, W. G. (1942). **Erysipelas in Pigs.**—*N.Z. J. Agric.* **65.** 207–211. **1439a**

In a bacteriological examination of 229 arthritic joints from pigs, 67% were shown to be due to chronic erysipelas infections. While few acute septicaemic outbreaks of erysipelas have been reported in New Zealand, the high incidence of chronic joint infections emphasizes the danger of further serious acute outbreaks and the desirability of controlling the chronic form of the disease. Recommendations for the control of the chronic infections are tabulated.—M. B. BUDDLE.

NIKOL'SKIĬ, V. V. (1940). Materialy po izucheniyu pasterelleza krolikov. **[Studies on Rabbit Septicaemia (Pasteurellosis)].**—*Trud. Troitsk. vet. Inst.* No. 3. pp. 7–79. **1440**

The author discusses in detail the literature, bacteriology, epizoology, symptoms, control, and prevention of rabbit pasteurellosis. Only the M form of *Past. lepiseptica* was isolated P.M. from 425 rabbits from Tatar A.S.S.R. and the Chelyabinsk and Sverdlovsk provinces ; the D form, regarded by the author as more virulent, was never met with. In his experience, only smooth colonies of M and D forms possessed specific antigenic and immunogenic properties ; the latter are closely associated with the polysaccharide-lipoid complex of the bacteria. During dissociation, changes occur in some of the bacteria which render this complex ineffective ; the dissociated G form is therefore regarded as unsuitable for immunization and for serological purposes. Various vaccines (aggressin, live glycerin vaccines, combined killed and live vaccines), prepared from M and D forms, were tested and found reliable for use in practice.

Tube and slide agglutination and precipitation tests were found to be suitable diagnostic methods.
—A. MOLDAWSKY.

BOW, M. R., & BROWN, J. H. (1943). **Tularaemia in the "Seven Persons Coulee", Alberta.**—*Canad. J. publ. Hlth.* **34.** 414–418. **1441**

Since 1940, in an area of less than 40 square miles, two cases of tularaemia in human beings occurred and *Pasteurella tularensis* was recovered from an outbreak in sheep, from three lots of *Dermacentor andersoni*, a dead jack rabbit, and two ground squirrels. The nature of the coulee makes it an ideal place for ticks and large numbers of "drag ticks" have been collected there.
—R. GWATKIN.

I. GOWEN, J. W., & CALHOUN, M. L. (1943). **Factors Affecting Genetic Resistance of Mice to Mouse Typhoid.**—*J. infect. Dis.* **73.** 40–56. **1442**

II. GOWEN, J. W., & CALHOUN, M. L. (1943). **On the Physical Basis for Genetic Resistance to Mouse Typhoid,** *Salmonella typhi-murium.*—*Proc. nat. Acad. Sci.* **29.** 144–149. **1443**

I. A comparison was made of the number and proportions of different blood cells of strains of mice highly resistant or highly susceptible to *Salmonella typhi-murium* infection. 250 mice were used, comprising two highly susceptible, two intermediate, and two highly resistant strains. There have been great variations in recorded figures of blood cell counts in mice. The authors found the main causes of these to be strain, age, sex, different environments, and nutrition. Sex was not an important cause of variation of any blood cell constituents, except possibly the lymphocytes. Age from 10–100 days did produce marked differences, but as the variations had no predictable or interpretable trend as age advanced from the youngest to the oldest, the authors considered these variations to be of minor significance. A correlation between strain and blood cell count was found, the strain with the highest resistance to mouse typhoid having the highest total leucocyte count, and the most susceptible strain having the least number of total leucocytes. A count of about 20,000 leucocytes per cu. mm. was obtained in highly resistant strains, and of only 12,000 per cu. mm. in highly susceptible strains. There was much less correlation between resistance to the disease and the proportions of the different types of leucocytes.

II. This is further work by the authors to correlate genetic strain resistance with the genetic cellular constitution of the blood in different strains of mice. As found in I, certain inbred strains of mice with a high susceptibility to mouse typhoid had low leucocyte counts. As no correlation as to the proportion of types of white cells could be demonstrated, the authors suggest that the different cell types may originate from one primary cell, depending on the environmental circumstances. They found that the red blood cell count was fixed with the strain of mouse, but not correlated to the resistance to mouse typhoid.

They quote the work of REICH & DUNNING (1941), on the correlation of the leucocyte level to longevity in rats, and also the work of ROBERTS, SEVERENS & CARD [*V. B.* **10.** 739.] on the correlation of the lymphocyte count to the resistance of chicks to pullorum disease. It is concluded that the evidence indicates that the total number of leucocytes or the numbers of particular kinds of leucocytes play a pronounced part in the immune phenomena controlled by the genetic constitution of the host.—R. COOMBS.

SANDERS, R. G., POMEROY, B. S., & FENSTERMACHER, R. (1943). **Cross-Agglutination Studies Between Salmonella Pullorum and Other Microörganisms Isolated from Turkeys Positive to the Pullorum Test.**—*Amer. J. vet. Res.* **4.** 194–198. **1444**

On many occasions, micro-organisms other than *S. pullorum* had been isolated from positive reactors to the agglutination test for pullorum disease. This suggested the possibility that these other organisms might cross-agglutinate *S. pullorum* and might also account for some of the atypical aggln. encountered in routine testing.

Five of the organisms which had been consistently isolated were selected, namely *S. pullorum*, *S. newport*, a proteus organism, a paracolon organism, and an organism with the characteristics of a salmonella except that it produced indole ; four turkeys were inoculated intravenously, one with each organism. The turkeys were bled twice a week and each serum was tested by the tube method with five antigens—one from each organism.

Considerable cross-aggln. was found to occur and at some time after inoculation, the turkeys infected with the proteus organism, the paracolon organism, and with *S. newport*, all showed a titre to pullorum antigen greater than 1 : 50. They would, therefore, have been diagnosed as pullorum-positive although not affected with *S. pullorum*. Also turkeys naturally infected (as shown subsequently by isolation) with these organisms had a titre to pullorum antigen. Throughout the investigation in the early and late stages of infection many atypical aggln. reactions were encountered.

Quantitative absorption studies, using a special procedure to determine the end-titre value used in calculating the quantitative absorption values, were made which gave further evidence of cross-aggln. between the organisms under investigation.—J. D. BLAXLAND.

—. (1943). Foreløpig melding fra Veterinaerdirektøren on resultatet av bekjempingen av smittsom kasting pr. 31. desember 1942. [**Report of the Veterinary Director, Norway, on the Results of the Control of Bovine Contagious Abortion up to 31st December, 1942**].—*Norsk VetTidsskr.* **55.** 240–245. **1445**

The control campaign had lasted for eight years by the end of 1942. During that time 3,143 herds had been detected and notified as infected and 3,122 of these (99·3%) had been freed from infection. There remained 21 herds (0·67%) not released from official supervision and of these six contained no positive reactors at the last test and only 15 herds were found to contain reactors. —J. E.

FILMER, J. F. (1942). **Vaccination Against Contagious Abortion.**—*N.Z. J. Agric.* **65.** 137–143. **1446**

Details are given of the newly sponsored Government scheme for the control of brucellosis, utilizing the vaccine prepared from the United States B.A.I. strain 19. It is intended that vaccination be confined in the main to calves of 4–8 months old in badly infected herds, but non-pregnant yearlings and adult cows under special circumstances may be included in the scheme. The co-operation of farmers is sought so that information may be obtained over several seasons that will assist in assessing the progress made in the control of the disease by vaccinal immunization.—M. B. BUDDLE.

*BAKTH, L., KABELITZ, G., & STELLER, K. (1940). Untersuchungen über das Fleisch klinisch gesunder, mit chronischer Bruzellose behafteter Rinder. [**Composition of the Meat of Clinically Healthy Cattle with Chronic Brucellosis**]. — *Ernährung.* **5.** 213–217. [Abst. in *Biol. Abstr.* Sect. F. **16.** No. 10. 13, copied *verbatim.* Signed: H. R. BIRD]. [See also *V. B.* **12.** 202]. **1447**

No significant differences were found between the flesh of normal control cattle and cattle affected with chronic brucellosis with respect to N, water, or ash content, digestibility by pepsin, trypsin, or a pepsin-trypsin mixture, or reaction to qualitative protein and amino acid tests.

HORTA, P. P. (1942). Bruceloses. [**Brucellosis (Human and Animal) in Brazil**].—*Arq. Hig., Rio de J.* **12.** 113–176. [English summary]. **1448**

H. has compiled details of cases of brucellosis in Brazil, where it is stated that the disease occurs sporadically in human beings, cattle, and goats. He refers to the clinical features, infection, transmission, and diagnosis (the latter in great detail). For control of undulant fever, he advocates pasteurization of milk, and examination of animals and milking personnel. —I. W. BROCKLEHURST.

*HASHIZUME, K., KAMOTO, K., & KIRIZAWA, T. (1940). [**Swine Brucellosis**].—*Res. Bull. imp. Zootech. Exp. Sta.* [*Tiba-si*]. **42.** 1–113. [In Japanese]. [Abst. in *Biol. Abstrs.* **16.** 192, copied *verbatim.* Signed: MASUO KODANI]. **1449**

No symptom was found to be common to all the cases studied although high temp., chronic arthritis and swelling of the testes were observed in a few cases. The infection caused frequent abortion which was usually followed by sterility. 52·3% of the infected swine showed macroscopic change in the spleen, reproductive organs, etc. *Brucella suis* was found by culture in various organs of 40·7% of the infected swine. Those which gave a positive agglutination test with 50 : 1 dilution of their sera had no lesions nor was *Brucella* recovered, whereas those which gave a positive reaction with 100 : 1 dilution of the sera did have lesions and *Brucella* was isolated from them. The agglutination test is suggested as a reliable method of diagnosis.

BERCHENKO, N. V. (1940). Normal'nyĭ agglyutinatsionnyĭ titr syvorotki krovi sobak po otnosheniyu k brutselleznomu antigenu. [**Agglutination Titre of Normal Dog Blood Serum against *Brucella* Antigen**]. —*Trud. Troitsk. vet. Inst.* No. 3. pp. 300–303. **1450**

Blood serum from 807 normal dogs was examined; serum from 700 (86·7%) did not have any agglutinins; in serum from 80 (9·8%), there was agglutination at a dilution of 1 : 5, and in 27 (3·5%) at 1 : 10; the agglutination, however, was never complete. B. concludes that normal dog serum does not agglutinate brucella at a dilution greater than 1 : 10.—A. MOLDAWSKY.

NEWMAN, H. C. (1943). **Sporadic Occurrence of Blackleg.**—*Vet. Med.* **38.** 489–490. **1451**

A brief description of the symptoms and P.M. findings in a case of blackleg in a five-month-old calf. This was the first recorded case in the area, but the exciting factors could not be determined.—J. KEPPIE.

OAKLEY, C. L. (1943). **The Toxins of *Clostridium welchii*. A Critical Review.**—*Bull. Hyg., Lond.* **18.** 781–806. **1452**

A comprehensive review of the toxins of all four types of *Clostridium welchii* (A, B, C, D). Aspects of the subject such as the identification and assay of the different toxic antigens, toxoiding, the properties and nature of the specific enzymes, etc. are separately considered and in each case useful references to recent developments are included.

In the measurement and typing of toxins it is advisable to make indirect determinations using pure antitoxins. Several indicators are available for the measurement of the activity of certain of the toxic antigens, and the use of them leads to more accurate analysis. The steps leading up to the important discovery that the α toxin is a lecithinase are given. This is the first occasion on which the toxic activity of a bacterial filtrate has been shown to be due to a characteristic enzyme. It is interesting to note that α toxin haemolyses the red cells of all laboratory animals except the horse and goat, and θ haemolysin is haemolytic for the red cells of most laboratory animals except the mouse. The method is described by which the complex toxins of types B, C, and D are analysed into their several components, and mention is made of the discovery of ϵ prototoxin in type D toxin, which is antigenic but remains inactive until acted upon by proteinases.

Work on the physiological effects of the toxins is summarized, but the findings are complex and the unabridged review or the original papers should be consulted. Useful tables show how, by the use of pure antitoxins for each of the seven known toxins, a *Cl. welchii* filtrate may be analysed and typed.—J. KEPPIE.

HUMPHREYS, F. A., & HELMER, D. E. (1943). **Pulmonary Sporotrichosis In a Cattle Beast.**—*Canad. J. comp. Med.* **7.** 199–204. **1453**

The history and P.M. findings of a case of this rather rare condition in cattle are briefly outlined. The organism was relatively avirulent for laboratory animals, producing only local lesions in white rats when inoculations were made subcutaneously at the base of the tail. The optimum temperature for growth was 30°C.; there was no growth at 37·5°C. Passage through white rats greatly lessened the ability of the fungus to grow on artificial media.—J. L. BYRNE.

PEREVEZENTSEV, V. V. (1940). Sluchaĭ mikoticheskovo proktita u loshadi. [**A Case of *Aspergillus* Infection in a Horse**].—*Trud. Troitsk. vet. Inst.* No. 3. 213–216. **1454**

A thoroughbred stallion showed painful defaecation, inappetence, loss of condition, and colic. Rectoscopy

revealed ulceration considered to be caused by an unspecified *Aspergillus*. The symptomatic treatment given was without effect.—A. MOLDAWSKY.

BERCHENKO, N. V., & PARAKIN, V. K. (1940). K klinike nekrobatsilleza svinei. [**Necrobacillosis in Pigs**].—*Trud. Troitsk. vet. Inst.* No. 3. pp. 304–307. **1455**

Necrobacillosis of piglets, weaning pigs, and occasionally of mature animals was observed on farms with poor hygienic conditions. Among various forms, necrotic stomatitis, dermatitis, and keratitis occurred. —A. MOLDAWSKY.

I. EDSON, N. L., & HUNTER, G. J. E. (1943). **Respiration and Nutritional Requirements of Certain Members of the Genus** *Mycobacterium*.—*Biochem. J.* **37.** 563–571. **1456**

II. HUNTER, G. J. E. (1943). **Growth-Promoting Substances from Bacteriological Filter Pads.**—*Ibid.* 577–580. **1457**

I. Using as basal medium a salt mixture with the ammonium ion as either the sole or the chief source of nitrogen, the authors investigated the effectiveness of growth stimulants, operating in concentrations of $1 \times 10^{-3}M$ or less, on the growth, respiration, and nutrition of certain species of mycobacteria. Species were found to vary widely in respiration and oxygen consumption in the presence of different substrates: under defined conditions, the growth stimulants found were citric acid, all α-amino acids, histamine, calcium, and iron. *Mycobact. butyricum* and *Mycobact. tuberculosis* (strains T, and H37—the only mammalian species studied) were found to be more exacting in their growth requirements than the other saprophytic species examined.

II. Seitz filtration for the sterilization of solutions of growth stimulants was found to extract appreciable amounts of calcium and ferric iron from the filter pads. Under the experimental conditions used, these ions functioned as growth stimulants for the acid-fast organisms studied, and their presence in filtrates accounted for certain anomalous results obtained with some of the growth preparations used in the investigations reported in I.—J. LOCHIEL MCGIRR.

MIRICK, G. S. (1943). **The Oxidation of *p*-Aminobenzoic Acid and Anthranilic Acid by Specifically Adapted Enzymes of a Soil Bacillus.**—*J. exp. Med.* **78.** 255–272. **1458**

Sets of tubes of salt solutions containing *p*-aminobenzoic acid at pH 6, 7, and 8 were inoculated with soil. Tubes at each pH contained acid and alkaline soils and were maintained aerobically and anaerobically at 22° and at 37°C. The concentrations of *p*-aminobenzoic acid were estimated daily. After seven days about a half of the *p*-aminobenzoic acid incubated with alkaline soil at pH 8 had been destroyed. Ten serial transfers were made from this alkaline culture into salt solution containing *p*-aminobenzoic acid but there was little growth and only slow destruction of the *p*-aminobenzoic acid. The addition of casein hydrolysate to the medium allowed the organism to grow rapidly and destroy the *p*-aminobenzoic acid. The isolated organism was a thin, motile, strictly aerobic Gram-negative rod, probably belonging to the family of Pseudomonaceae. The rate of destruction of amino acid by the organism varied with the amount of *p*-aminobenzoic acid which had previously been present in the medium, indicating that the destruction was due to an adaptive enzyme. The destruction is presumably oxidative as the respiration of adapted cells in the presence of *p*-aminobenzoic acid is much higher than the respiration of non-adapted cells. The production of the enzyme was also stimulated by acetylaminobenzoic acid, glycylaminobenzoic acid, nitrobenzoic acid, *p*-toluic acid, esters of *p*-aminobenzoic acid, and by *p*-aminophenylacetic acid. When the organism was grown in tryptophane or anthranilic acid it developed an enzyme capable of destroying anthranilic acid. The adapted organisms can be utilized to increase the specificity of the colourimetric estimation of *p*-aminobenzoic acid or anthranilic acid. —E. BOYLAND.

See also absts. **1616** (streptococcal vaginitis), **1629** (TB. diagnosis), **1539** (infectious rhinitis in swine), **1610**, **1612** (*Cl. welchii* infections), **1599-1607** (antibacterial substances).

DISEASES CAUSED BY PROTOZOAN PARASITES

KAZANSKIĬ, I. I. (1940). O patologii kozhi pri su-auru. [**Pathology of the Skin in Surra**].—*Veterinariya, Moscow.* No. 2. pp. 83–84. [French summary]. **1459**

This is a description of skin lesions in two g. pigs and two rabbits experimentally infected with *Trypanosoma ninae kohl-yakimov* [*T. evansi*]. The lesions were situated on the inner surface of the thigh and around the eyes, nose, and ears, resembling eczema with alopecia and punctate haemorrhages. In one rabbit, after treatment with "naganin", the lesions disappeared. K. observed similar skin lesions in camels in infected areas. —A. MOLDAWSKY.

ROUBAUD, E., & PROVOST, A. (1941). Infection du cobaye par le trypanosome des ruminants des Antilles *Trypanosoma viennei* souche américaine de *Tr. cazalboui* (*vivax*). [**Infection of G. Pigs with *T. viennei* (American strain of *T. vivax*) from Cattle in the Antilles**].—*Ann. Inst. Pasteur.* **67.** 359–360. **1460**

In inoculating rabbits with the American strain of *T. vivax*, the greatest success was obtained when trypanosomes from a recently infected goat were used. By the use of a similar inoculum intraperitoneally, a g. pig was successfully infected, and the strain has now been carried through four g. pig passages. Infections in g. pigs are said to persist much longer than those in rabbits, and may persist for several months without causing any mortality.—U. F. RICHARDSON.

MAZZA, S., & CHACON, R. V. (1943). Primeros animales domésticos y seres humanos con Schizotrypanum cruzi comprobados en Bolivia. [**The First Cases of Chagas' Disease in Domestic Animals and Man in Bolivia**].—*Prensa méd. argent.* **30.** Reprint pp. 8. [Only reprint seen]. **1461**

The authors report finding infection by *Trypanosome cruzi* of one dog and one child in Bolivia. These are stated to be the first cases reported.—M. WATSON.

PACKCHANIAN, A. (1943). **On the Viability of Various Species of *Trypanosoma* and *Leishmania* Cultures.**—*J. Parasit.* **29.** 275–277. **1462**

Fifteen species of trypanosomes, which included *T. lewisi* and *T. melophagium*, and four other species of flagellates including *Leishmania donovani* and *L. tropica*, kept on blood-agar slants at room temperature, were found to be actively motile when one month old, and subcultures from such tubes nearly always yielded 100% positive results. In many cases subcultures were obtained at the end of two months, and occasionally during the third month.

Out of 124 subcultures of *T. cruzi* kept *in vitro* for approximately six years, 13 tubes were found still to contain actively motile trypanosomes, and 110 cultures kept for about six months gave 68 positive findings.—U. F. RICHARDSON.

HAMMOND, D. M., & BARTLETT, D. E. (1944). **The Relative Value of Sedimentation and of Saline-Egg Culture in the Examination of Bovine Vaginal and Preputial Samples for Trichomonas Foetus.**—*J. Amer. vet. med. Ass.* **104.** 10–12. **1463**

Evidence is presented to support the view that the efficiency of diagnosis of trichomoniasis is increased if direct microscopic examination of the material is made after 1–3 hours' sedimentation, but that it is not materially increased by routine culturing on a saline-egg medium as used by AVERY & GARLICK [*V. B.* **11.** 16]. Of 415 samples obtained from seven infected females, *T. foetus* was detected in 117, in 103 (88%) of them by direct examination and in 14 (12%) by culture only. From two infected bulls, 24 positive samples were obtained by direct examination and none by culture only. From a further ten infected females, 640 samples were examined and *T. foetus* was found in 221, in 194 (88%) of them by immediate direct examination, in 22 (10%) by examination after sedimentation only, and in 5 (2%) by culture only. From three other infected bulls, 40 positive samples were found, 37 being detected by immediate direct examination, two by examination after sedimentation only, and one by culture only. A comparison of trichomonad counts made before and after 24 hours' culturing in saline-egg and in 0·7% saline media at room temperature showed that there was an increase in numbers in six of 15 tubes containing saline-egg medium, but in none of the saline tubes, which, with two exceptions, showed a marked decrease in numbers. Culturing in saline-egg medium at room temperature had little effect on multiplication in samples containing very few trichomonads.—M. L. BINGHAM.

BECKER, E. R., MANRESA, M., Jr., & SMITH, L. (1943). **Nature of Eimeria nieschulzi-Growth-Promoting Potency of Feeding Stuffs. 5. Dry-Heating Ingredients of the Ration.**—*Iowa St. Coll. J. Sci.* **17.** 257–262. [For part III, see *V.B.* **14.** 191. Part IV not traced]. **1464**

It has been shown that pantothenic acid may nullify the parasite-growth-inhibiting properties of the combined use of vitamins B_1 and B_6 in *E. nieschulzi* infection and that it favoured the production of oocysts [see *V. B.* **14.** 191]. In the present experiments, dry-heating of casein and wheat middlings was adopted to destroy the pantothenic acid. By using this method it was possible to feed large amounts of crude casein with heated wheat middlings, or large amounts of unheated wheat-middlings with heated crude casein; in this way the pantothenate content of each ingredient of the ration could be manipulated without materially interfering with the other vitamins present. Heating half of one ingredient, casein, was also practised. Rats which received heated casein plus a supplement of pantothenic acid showed an increased oocyst output. To provide against the possibility that a new positive property was conferred upon the ration by the heating process vitamin-free casein was fed in place of dry-heated crude casein. The results were similar to those previously obtained except that the growth rate of the rats was not as good.—C. HORTON SMITH.

PERRIN, T. L. (1943). **Spontaneous and Experimental Encephalitozoon Infection in Laboratory Animals.**—*Arch. Path.* **36.** 559–567. **1465**

Spontaneous *Encephalitozoon* infection was found in five of 502 white Swiss mice, in two of 283 albino rats and in one of 291 g. pigs, but 50 rabbits were all negative. All the infected animals exhibited meningo-encephalitis, but when experimentally transmitted the strain was of low virulence and no deaths were attributed to it.

Experimental infection could be produced by intracerebral, intraperitoneal, or intranasal inoculation in mice, and infections were also produced in hamsters and young rats, whilst the results in rabbits are described as suggestive but not conclusive. Attempts to infect adult rats and g. pigs were unsuccessful. Spread of infection to newborn mice through contact with infected mothers was demonstrated.

The parasites could not be cultivated, but tissues containing them remained infective up to 15 weeks when preserved at 4°C. in either 50% buffered glycerin or Tyrode's solution, or when rapidly frozen or stored at –70°C.—U. F. RICHARDSON.

PERRIN, T. L. (1943). **Toxoplasma and Encephalitozoon in Spontaneous and in Experimental Infections of Animals. A Comparative Study.**—*Arch. Path.* **36.** 568–578. **1466**

Spontaneous *Toxoplasma* infection was encountered in g. pigs and rabbits in which no clinical symptoms were detected, but two strains inoculated into mice proved highly virulent. *Encephalitozoon* occurred spontaneously in albino rats and mice, and was encountered in a single g. pig, but had little virulence for any of these animals. Toxoplasmosis of mice was usually associated with necrotic lesions in the brain which did not occur in *Encephalitozoon* infections.

It is claimed that *Encephalitozoon* occurs as straight or slightly curved rods which may be slightly constricted in the middle, whilst *Toxoplasma* occurs as lanceolate, crescentic, or fusiform organisms, which are definitely broader and often longer than *Encephalitozoon*. Toxoplasms stain much more clearly with modified Romanowsky stain or with haematoxylin and eosin, but with Goodpasture's stain or the method recommended by Wright and Craighead, *Encephalitozoon* stain more deeply.

Certain minor differences between the two parasites are also claimed to occur in their disposition in sections and their distribution in the tissues. Material from *Encephalitozoon*-infected mice remained infective after rapid freezing and storage at –70°C., whilst *Toxoplasma* material did not.—U. F. RICHARDSON.

ASHBURN, L. L., & PACKCHANIAN, A. (1943). **Histogenesis of Experimental Icterohemorrhagic Spirochetosis in Albino American Deer Mice (*Peromyscus maniculatus* Gambelii).**—*Amer. J. trop. Med.* **23.** 607–613. **1467**

In an attempt to ascertain the origin of the jaundice in Weil's disease, albino deer mice were inoculated with a strain of *Leptospira icterohaemorrhagiae*, and groups of them were killed on consecutive days commencing on the second and ending on the seventh day. Detailed pathological findings are given in respect of the kidney, liver, spleen, lung, and bone marrow, and it is concluded that the hepatic damage, consisting principally of cell enlargement, increase in the number of nuclei, and disruption of liver cords due to loss of cohesion between cells, is sufficient to explain the occurrence of jaundice. —U. F. RICHARDSON.

JOHNSON, D. W. (1943). **Epidemiology of Weil's Disease. [Correspondence].**—*Brit. med. J.* Nov. 20th. 659. **1468**

Attention is drawn to the fact that *Leptospira pomona* and *L. mitis* are known to be endemic in pigs and cattle in the coastal districts of South Queensland, Australia, and that *L. icterohaemorrhagiae* has been found to be endemic in Samoan pigs. It is suggested that outbreaks of human leptospiral jaundice in Great Britain may originate from farm stock in the carrier phase of infection.—U. F. RICHARDSON.

*Rimpau, W. (1942). Systematische Untersuchungen von Feldmäusen auf Leptospiren. (Vorläufiger Bericht). [**Infection of Field Mice with Leptospira. Preliminary Note**].—*Münch. med. Wschr.* pp. 991–992. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 300]. **1469**

Investigations showed that field mice and woodmice in the valleys of the Danube, Elbe, and Saal are infected with *Leptospira grippo-typhosa*, the causal organism of human " swamp fever " in Eastern Europe. Organisms could be detected in kidney emulsion, but not in the bladder or urine. Serological tests also gave positive results. Both young and old animals were infected. Even with the establishment that this infection exists in rodents does not fully explain the origin of the human disease, as the geographical distribution of infection in rodents and in human beings is not identical. The existence of the infection in field mice is, however, sufficiently important to justify a campaign for the destruction of these animals; agriculturists should not work bare-footed.—U. F. Richardson.

*Bianchi, C. (1942). L'isolamento delle leptospire per filtrazione " in vivo ". [**Isolation of Leptospira by Filtration** *in vivo*].—*G. Batt. Immun.* **28.** 583–591. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 296]. **1470**

The value of intraperitoneal inoculation of g. pigs as a method of isolating pure strains of leptospira from contaminated material [see *V. B.* **11.** 220, and **13.** 281.] is confirmed, the leptospira passing relatively easily through the peritoneal serosa into the circulation whilst bacteria such as staphylococci and streptococci are retained.—U. F. Richardson.

See also absts. **1630** (medium for cultivating *T. cruzi*), **1514** (trypanosomiasis control), **1653** (trypanosomiasis in Nyasaland), **1613** (chemotherapy of tropical diseases), **1619** (treatment of trichomonad infection), **1615** (drug action on *Plasmodium lophurae*).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Verge, J., & Goret, P. (1941). Sur la conservation de quelques ultravirus par la dessiccation. [**Conservation of Viruses by Desiccation**].—*Ann. Inst. Pasteur.* **67.** 367–370. **1471**

Attention is drawn to the value of desiccation *in vacuo* of frozen emulsions of virus containing tissues as a method of preserving viruses. The fixed virus of rabies has been thus preserved for 1,594 days, that of Aujeszky's disease for 977 days, louping ill for 1,422 days, and equine encephalomyelitis for 441 days. If emulsions are made in sera instead of physiological saline, or if 10% gum acacia is added to the saline, viruses can be preserved for longer periods. Thus distemper virus in saline tissue emulsion was not active after a year, but when gum acacia was added it remained infective for 16 months.—U. F. Richardson.

Pyl, G., Hobohm, K. O., & Holz, K. (1942). Die reversible Inaktivierung von Virusadsorbaten beim Gefrieren. [**Reversible Inactivation of Virus Adsorbates by Freezing**].—*Z. ImmunForsch.* **102.** 45–53. **1472**

The inactivation of foot and mouth disease virus adsorbed on to aluminium hydroxide depends on the dehydration of aluminium hydroxide gel. The inactivation is reversible and can be overcome by fine dispersion, the activity being completely restored. The antigen inactivated by freezing does not produce disease in g. pigs or cattle. Inactivation is hindered by small concentrations (5%) of glycerin even when a complete solidification is produced. This concentration of glycerin reduces the value of the vaccine. On the other hand, 20% glycerin has no harmful effect on the immunizing value.—John Francis.

Traub, E., & Möhlmann, H. (1943). Typbestimmung bei Maul- und Klauenseuche mit Hilfe der Komplementbindungsprobe. I. Mitteilung: Versuche mit Seren und Antigenen von Meerschweinchen. II. Mitteilung: Versuche mit Meerschweinchenserum und Rinderantigen. [**Complement-Fixation Test for Typing Foot and Mouth Disease Virus. I. Tests with Sera and Antigens from G. Pigs. II. Tests with G. Pig Serum and Bovine Antigen**].—*Zbl. Bakt. I.* (*Orig.*). **150.** 289–300 & 300–310. **1473**

I. Complement-fixation tests were performed with strains of F. & M. disease virus from natural cases. The serum containing complement-fixing antibody was prepared in g. pigs by repeated plantar inoculation of the tested strains, while an antigen was prepared from primary plantar lesions resulting from the inoculation of g. pigs with one of three standard strains, O, A, or C. Cross-immunity tests were performed by inoculating the test or standard strains into g. pigs immunized against either. Twenty-four natural strains were tested. Of these, 11 serologically pure strains gave rise to complement-fixing antibodies, and to immunity, in g. pigs against one type of virus only; four serologically impure strains gave complement-fixing antibodies and immunity against two types simultaneously. The method was of no practical value, however, as the remaining nine strains produced no complement-fixing antibody.

II. Complement-fixation tests with serum from naturally infected bovines and bovine antigen, or bovine serum or g. pig antigen, were also of little use in rapid determination of the virus type, but good results were obtained by the use of an antigen prepared from primary tongue lesions in animals experimentally inoculated with the virus strain to be tested, and a serum from g. pigs hyperimmunized against one of the standard strains O, A, or C. The results of c.-f. tests paralleled those of cross-immunity tests in those cases where the natural strains were pure, but variants or mixtures of more than one type were only recognizable by the c.-f. tests, the cross-immunity tests only revealing one component.

It was found by cross-immunity tests on cattle that virus strains shown to be of type O or type A by the c.-f. tests were also immunologically simple and distinct types.—E. Cotchin.

Berchenko, N. V., Parakin, V. K., & Trutnev, P. F. (1940). Bolezn' Ozheshki svineĭ v Yuzhnom Urale i ee diferentsial'naya diagnostika. [**Aujezky's Disease in Pigs in South Ural**].—*Trud. Troitsk. vet. Inst.* No. 3. p. 310. **1474**

Outbreaks were first observed during the autumn and winter of 1938–39, mainly among weaning piglets; a mild form and a more severe nervous form occurred. No details are given. Differential diagnosis is briefly discussed.—A. Moldawsky.

Pace, R. (1943). Algo sobre a raiva dos herbivoros no Brasil. (Contribuição pessoal em torno dos trabalhos no combate à um foco rábico, em Ubatuba). [**Paralytic Rabies in Cattle in Brazil. Control of an Outbreak in Ubatuba**].—*Bol. Soc. brasil. Med. Vet.* **12.** 99–107. **1475**

P. discusses the various outbreaks of paralytic rabies in herbivorous animals in Brazil. In every case vampire bats were found to be the vectors of the disease.

P. wonders, however, whether there is not some unexplained factor in the spread of this disease, since it did not spread to the herds of dairy cattle in the Parahiba valley, although there was an outbreak in nearby Ubatuba. He suggests that the *serras* (mountain ridges) may prevent bats from travelling in certain directions and that an area surrounded by mountain chains might thus remain free from the disease, even without preventive vaccination.—MILLER WATSON.

CARNEIRO, V. (1942). A raiva e sua transmissão pelo morcego. **[Rabies and Its Transmission by Bats].**—*Biológico, S. Paulo.* **8.** 73–79. **1476**

A brief résumé of knowledge on rabies. The role is stressed of blood-lapping bats in the transmission of paralytic rabies to domestic animals. No new material is presented.

REMLINGER, P., & BAILLY, J. (1941). Il n'est pas possible de tirer des passages par la souris un caractère différentiel entre le virus rabique fixe et le virus de rue. **[Impossibility of Differentiating Fixed and Street Rabies Virus by Passage Through Mice].**—*Ann. Inst. Pasteur.* **67.** 186–188. **1477**

It was found impossible to confirm the claim of LEGEZYNSKI that the "street" virus of rabies lost its virulence when passaged through mice by intracerebral inoculation 4 or 6 times. When both white and grey mice and rabies virus of canine, equine, and asinine origin were used, no attenuation was obtained after 10–12 passages, and, in fact, the virulence to mice was enhanced. It is concluded that the "street" virus of rabies cannot be differentiated from the fixed virus by mouse passage.—U. F. RICHARDSON.

MERLING, K. B. E. (1943). **Ultramicroscopical Observations on the Morphology and Development of Vaccinia Virus** *in Vitro.—Brit. J. exp. Path.* **24.** 240–245. **1478**

M. confirmed previous observations on the morphology and life-cycle of vaccinia virus *in vitro*, in material from the infected cornea of rabbits. Optical systems giving a high degree of resolution at the highest magnifications enabled him to produce 18 photomicrographs of normal corneal cell disintegration and disintegration associated with the presence of vaccinia virus. Formation of new virus colonies from sheets of virus bodies, in the absence of living cells, was observed, and all forms of the life-cycle of the virus (elementary bodies, discs, and spheres) were seen within the colonies. These colonies moved upon the slide, and divided into daughter colonies.—G. B. S. HEATH.

HORGAN, E. S., & HASEEB, A. M. (1944). **Some Observations on Accidental Vaccinations on the Hands of Workers in a Vaccine Lymph Institute.**—*J. Hyg., Camb.* **43.** 273–274. **1479**

Attendants in charge of animals used for the preparation of vaccine lymph frequently develop a severe eruption on their hands in spite of the existence of scars from vaccination in infancy and revaccination before they are permitted to handle infected animals. These reactions are of the vaccinal or vaccinoid type.

No explanation can be given for the occurrences of this phenomenon in persons presumably strongly immune. It is suggested, however, that there may be a similarity between such cases and the repeated eruptions on the hands of farm workers in contact with cows affected with natural cow pox.—R. E. GLOVER.

VASIL'EV, A. V. (1940). Izmenenie krovi pri eksperimental'nom zarazhenii krolikov fiksirovannymi virusami epizooticheskovo entsefalomielita i bolezni Borna loshadeĭ. **[Blood Changes in Rabbits Experimentally Infected with Fixed Viruses of Equine Encephalomyelitis and Borna Disease].**—*Trud. Troitsk. vet. Inst.* No. 3. pp. 86–125. **1480**

Detailed studies were made of changes in the blood cellular constituents in rabbits infected with Borna disease virus and with E.E. viruses isolated in the U.S.S.R., *viz*, Moscow viruses 2 and 6, Leningrad viruses 1 and 2, Kazan (Tatar) virus, and Ural virus. All viruses from the first day of infection produced various degrees of haemolysis and set up regenerative and degenerative erythroblastic and leucoblastic processes in the bone marrow.

The most pronounced changes were observed in rabbits infected with the Moscow, Leningrad, and Ural viruses. Kazan virus, although responsible for severe nervous symptoms, produced less characteristic changes in the blood. Borna virus produced different changes from the E.E. viruses. Similar pathological changes were produced by virus filtrates; these changes tended to disappear during recovery of the animals. Blood changes could be observed before the appearance of nervous symptoms. It is concluded that infection with E.E. viruses has a septicaemic character which involves all the organs.—A. MOLDAWSKY.

LAMKIN, S. I. (1940). Izmenenie granulofilotsitov u krolikov pri eksperimental'nom infektsionnom meningo-entsefalomielite i bolezni Borna loshadeĭ. **[Changes of Granulophilocytes in Rabbits Infected with Equine Encephalomyelitis and Borna Disease].**—*Trud. Troitsk. vet. Inst.* No. 3. pp. 141–170. **1481**

Granulophilocytes [this term is applied to erythrocyte precursors, including reticulated, granulated forms, etc.] as described by MOLDAWSKIĬ in human beings in anaemia and by VASILIEV in rabbits poisoned by haemolytic substances, appear also in the blood of rabbits infected with various E.E. viruses and with the virus of Borna disease. There are characteristic variations in the structure of these cells indicating haemapoietic disturbances. Pronounced deviation from Moldawskiĭ's formula was found in rabbits infected with Borna disease virus; the changes were less pronounced in infection with E.E. viruses.

L. considers that Moldawskiĭ's formula is useful for evaluating the blood factor in anaemia.—A. M.

EKLUND, C. M., & BLUMSTEIN, A. (1942). **Minnesota's Experience with Human Encephalitis Caused by the Equine Type of Virus in 1938.**—*Minn. Med.* **25.** 103–107. **1482**

During an epizootic of equine encephalomyelitis in Minnesota in 1938, 23,686 horses were reported as affected. Forty-seven human cases of encephalitis were also reported. Neutralization tests were made with sera from 21 of these human cases; 14 neutralized the Western type of E.E. virus and two others the St. Louis virus; no cross-tests were made. Clinical symptoms in patients whose sera neutralized the St. Louis virus did not differ from those in the patients whose sera neutralized the Western E.E. virus. Only two of the latter 14 cases had had contact with affected horses.

Five varieties of *Aëdes* mosquitoes, capable of transmitting Western E.E. virus under experimental conditions, occur in Minnesota.

HAMMON, W. McD., & REEVES, W. C. (1943). **Laboratory Transmission of Western Equine Encephalomyelitis Virus by Mosquitoes of the Genera Culex and Culiseta.**—*J. exp. Med.* **78.** 425–434. **1483**

Western E.E. was transmitted, under laboratory conditions, by *Culex tarsalis*, *Culiseta inornata*, and *Culiseta incidens*. The virus survived for some time in *Culex stigmatosoma* and *Psorophora confinnis*, but in these two cases, transmission was not demonstrated. *Culex tarsalis* was shown to be capable of transmitting

the virus from one fowl to another, which lends support to the theory that fowls may serve as reservoirs of the virus in nature.—I. W. BROCKLEHURST.

HUANG, C. H. (1943). **Further Studies on the Titration and Neutralization of the Western Strain of Equine Encephalomyelitis Virus in Tissue Culture.**—*J. exp. Med.* **78.** 111–126. [For previous article, see *V. B.* **13.** 319]. **1484**

Following upon the observation that tissue fails to grow when heavily infected with Western E.E. virus, H. demonstrated further the use to which this fact can be put for the titration and neutralization of virus.

The medium used consisted of minced skeletal muscles of nine day developing chick embryos suspended in physiological solution and advantage was taken of Sigurdsson's observation concerning the coalescence of separate pieces of tissue in normal cultures to titrate the point in series at which added virus first prevented this from occurring. Results by this method, when compared with mouse inoculation tests, were not sufficiently constant and so an improved technique involving the use of many pieces of tissue in the one tube was adopted. Neutralization tests on similar lines compared favourably with those carried out by mouse inoculation. It is stressed that a saving is effected in both labour and time by the titration or neutralization of viruses in tissue culture as opposed to mouse inoculation.—J. C. BUXTON.

—. (1939). **British East African Territories. Report of Proceedings of the Second Conference on Rinderpest Held at Nairobi, 7th and 8th February, 1939.** pp. 52. Nairobi: Govt. Printer. [8vo]. [See also *V. B.* **8.** 699]. **1485**

Representatives of Kenya, Tanganyika, Uganda, the Belgian Congo, Nyasaland, Southern Rhodesia, Portuguese East Africa, and the Union of South Africa met at Nairobi to discuss the position of rinderpest in Eastern Africa after the completion of the immunization of cattle in the belt in southern Tanganyika Territory, undertaken to prevent the extension of the disease to the territories to the south.

It was pointed out that after the creation of the immune belt of cattle which necessitated the serum-virus inoculation of 51,800 cattle and a course of three inoculations with rinderpest vaccine of 97,200 cattle, the disease in game on the eastern flank of the belt had apparently died out, but that on the western flank it was thought that rinderpest still existed in a fly belt, and that game movements might lead to its extension to some 60,000 unprotected cattle to the south and adjacent to this area. As regards game dissemination, it was suggested that the disease rarely spread by this agency for more than 50 miles, though one extension of 70 miles was recorded, and it was decided that it would be sufficient if in the area in question adequate veterinary staff were provided to keep a close watch on developments.

The general question of rinderpest eradication was discussed, and it was recommended that as the immunity in the protected belt would be lost in the near future, owing to the loss of immunity by vaccinated animals and by the birth of susceptible calves, it would be advisable to extend eradication measures northward in Tanganyika. In Kenya it was proposed to maintain immunity for the present, but it was the intention to carry out eradication only as far as the Northern Province. In Uganda, the veterinary department was prepared to eradicate the disease and to keep the country free. The bearing of rinderpest eradication on overstocking and thus on soil erosion was discussed and it was resolved that "the permanent existence of rinderpest . . . cannot be regarded as in any way contributing to a solution of the problem of overstocking and soil erosion. Each set of problems must be tackled independently". The evils of overstocking and soil erosion can only be fought satisfactorily if the animal population is healthy and capable of improvement.

The relative merits of serum-virus inoculation, inoculation with vaccine and the use of goat virus were discussed, but it was decided that the method of choice might vary according to the circumstances of the area under action.

A report was submitted on the attenuation of rinderpest strains by passage through goats in Kenya. Some of these strains have become so attenuated that already small-scale immunization of cattle had been carried out with them, and it was proposed to use them for eradication purposes, controlled with small doses of serum or vaccine. Experimental evidence was produced that in using these strains the danger of spreading infection through small animals is remote, as is also the danger of spread through cattle.

The cost of the work on eradication proposed in Kenya and Tanganyika was estimated at £40,000, it being proposed that the Colonial Development Fund should supply £30,000, other contributions being made by Kenya, Tanganyika, Rhodesia, Nyasaland, the Union of South Africa, the Portuguese East African Territories, and the Belgian Congo.—U. F. RICHARDSON.

BAKER, J. A. (1943). **A Filterable Virus Causing Enteritis and Pneumonia in Calves.**—*J. exp. Med.* **78.** 435–446. **1486**

An infectious disease of calves, characterized by fever, diarrhoea, and pneumonia, usually followed by recovery, has been described in America and in other countries [see SAUNDERS—*V. B.* **10.** 43].

B. gives a detailed account of the experimental production of the disease in mice and calves, and produces evidence to show that the disease in two herds was due to a filtrable virus passing a Berkefeld N filter. In natural cases, animals killed at the height of the disease showed catarrhal enteritis and bronchopneumonia. Serial passage of bronchial washings or lung suspensions from natural cases produced a pneumonia in white mice. Infection of calves regularly followed the intranasal inoculation of lung suspensions from infected mice, but in only two of four calves inoculated intratracheally. Contact of healthy calves with naturally or experimentally infected calves led to infection.

In the experimental disease in calves, fever set in 2–4 days after inoculation, rising gradually to a peak temperature of 40°–41°C., and lasting 3–5 days. Diarrhoea and pneumonia followed closely the onset of fever. Early in the disease, the virus was demonstrable only in the intestines and lungs, but at the height of the fever had spread throughout the body.

Calves recovered from the disease resisted subsequent infection, in one case tested for at least three months; their sera neutralized, but not completely, the causal agent. The serum of normal calves was without effect on the virus. Cultures from the infected lungs of calves and mice showed as a rule no bacterial growth, although *Pasteurella* was isolated from one natural fatal case.—E. COTCHIN.

CASALS, J., & WEBSTER, L. T. (1944). **Relationship of the Virus of Louping Ill in Sheep and the Virus of Russian Spring-Summer Encephalitis in Man.**—*J. exp. Med.* **79.** 45–63. **1487**

A neurotropic virus causing encephalitis in man has been isolated in Russia. The agent is transmitted by pasture ticks (*Ixodes persulcatus*) and is readily

established in mice by intracerebral, intraperitoneal, or subcutaneous inoculation. The virus was compared with that of louping-ill by complement-fixation, neutralization, and cross-resistance tests. Although slight immunological differences were observed, especially in regard to pathogenicity for mice which were more susceptible to the Russian virus, there was obviously a close relationship between the two agents. They were infective for mice, sheep and monkeys but were not transmissible to g. pigs, rabbits or rats: both were dissimilar to the viruses of St. Louis encephalitis and of Japanese B encephalitis.—R. E. GLOVER.

*KROPF, R. (1940). Abschliessender Bericht über meine Erfahrungen mit der Schweinepestvakzineimpfung nach Dr. Michalka. **[Concluding Report on Experiences with Michalka's Swine Fever Vaccine].** —*Tierärztl. Rdsch.* **46.** 425–426. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* March 7th. 116. (1941)]. **1488**

The vaccine [see GEIGER—*V. B.* **5.** 574.] has been used for five years. This report deals with the vaccination of 499 pigs in premises where swine fever is common. Disadvantages of the method are that two inoculations have to be carried out at an interval of 14 days and that these inoculations have to be repeated after about four months. At the time of the first inoculation pigs were also immunized against erysipelas without any harmful effects. It was concluded that the use of the vaccine reduced losses in young pigs, but the importance of dealing also with other diseases is emphasized.—JOHN FRANCIS.

MORCOS, Z. (1943). **Distemper in Dogs.**—*Vet. J.* **99.** 215–219. **1489**

A vaccine was prepared from material from a naturally occurring case. Six dogs which were infected during the same outbreak were given the vaccine one month after the onset of illness; they recovered. A vaccine was then made from dogs obtained for the purpose, their previous histories being presumably unknown; it is said to have given useful results when used for prophylactic and curative purposes on 200 dogs.—C. V. WATKINS.

GOCHENOUR, W. S. (1943). **Feline Distemper.**—*N. Amer. Vet.* **24.** 104–108. **1490**

G. refers to literature on the blood picture in feline distemper and treatment of the disease by formol-killed tissue vaccine and antiserum. The disease is widespread in the U.S.A. Adult cats may be "immune carriers" and pass the disease to all half-grown cats in contact within a week, either directly or possibly through a reservoir in certain ectoparasites or vermin.

Degenerative changes and intranuclear inclusions are found in affected animals in epithelial cells of the liver, kidneys, and small intestines. Pathological changes may be slight. Dehydration of tissues occurs in chronic cases. In cases with severe intestinal involvement, there is acute dysentery, especially of the ileum; the liver and spleen may be enlarged and also the mesenteric lymph nodes in which there may be petechiae. Blood changes are those of panleucopenia (a reduction from 15,000 to 2,000 white blood corpuscles per cu. mm. with neutrophiles almost absent). Prognosis may be based on observation of the blood changes. If the leucopenia does not fall below 5,000, prognosis is good and more so if the Shilling nuclear index shifts to the left.

Protective vaccination by two inoculations with formol-killed tissue vaccine is recommended. If there has been immediate exposure to infection, antiserum should be given. Vaccine may then be given a week later. Drug therapy has not been effective.—C. V. W.

HEATH, L. M., & PLUMMER, P. J. G. (1943). **Distemper Studies in Foxes. II: The Comparative Experimental Vaccination of Foxes During an Epizootic with Formalized Suspensions Prepared from Homologous and Heterologous Tissues Respectively,** —*Canad. J. comp. Med.* **7.** 205–212. [For part I, see *V. B.* **14.** 88]. **1491**

The products employed for preventive and control measures in the epizootic consisted of two formolized tissue suspensions, mink and ferret tissue suspensions respectively, and fox anti-distemper serum. 141 apparently healthy cubs, 14 sickly foxes and seven severely sick foxes were divided into groups and given the various inocula; those in the severely sick group were given antiserum as well as tissue suspension. The results from this work and of studies conducted simultaneously on transmission can be summarized as follows:– (1) Heterologous tissue vaccines gave as good or better results than the homologous; only 8%, however, of the controls died. (2) The number of animals used did not permit proper evaluation of the therapeutic properties of the vaccines employed either alone or in conjunction with antiserum. (3) There is some indication that a combination of virus and coccidia may be necessary to cause death—certainly the most prominent macroscopic pathological changes were in the alimentary tract. (4) Composite tissue suspensions prepared from naturally infected foxes set up typical distemper symptoms in ferrets but not in foxes; a bacteria-free filtrate, however, prepared from the intestinal mucosae of an infected fox caused distemper in both species. (5) The presence of inclusion bodies was not a reliable diagnostic test for distemper in foxes.—J. L. BYRNE.

HEATH, L. M. (1943). **Distemper Studies in Foxes. III. The Cross Immunizing Properties of Homologous and Heterologous Tissue Vaccines against Experimental Distemper of Foxes and Ferrets.**—*Canad. J. comp. Med.* **7.** 266–272. [See also preceding abst.] **1492**

HEATH, L. M., & PLUMMER, P. J. G. (1943). **Distemper Studies in Foxes. IV. Maintenance of Virulence of Distemper Virus for Foxes.**—*Ibid.* 306–313. **1493**

III. Foxes treated with two fox- and two ferret-tissue vaccines survived challenge with a dose of virus which killed two of three untreated foxes. Ferrets were also protected by two ferret-tissue vaccines, but only one of the fox-tissue vaccines showed any evidence of immunizing qualities for these animals. The ferrets from which the vaccine tissue was obtained were infected with the same fox viruses as those used for the preparation of the fox-tissue vaccine.

IV. A Berkefeld filtrate of intestinal mucosa of a naturally infected fox contained a more virulent virus for foxes than a suspension of lung-liver-spleen tissue from the same animal. Both the filtrate and suspension were virulent for ferrets, but symptoms appeared earlier in those which received the suspension. Repeated tests of filtrates of lung-spleen tissue and of intestinal mucosa failed to show any superiority of the latter as a source of virus. Serial passages of the filtrable infective agent through ferrets or foxes appear to result in loss of virulence for foxes. Neither method reduced the virulence for ferrets. Alternate passages in ferrets and foxes appear to maintain to a certain extent the virulence of the virus for young foxes.—R. GWATKIN.

JUNGEBLUT, C. W. (1943). **Biological Changes in Theiler's Virus of Spontaneous Mouse Encephalomyelitis.**—*Amer. J. publ. Hlth.* **33.** 1227–1243. **1494**

Theiler's virus of mouse encephalomyelitis, adapted by passage to growth in cotton rats, developed new biological properties. These were indicated by a marked

increase in peripheral invasiveness for albino mice and cotton rats and by the ability to induce various types of central nervous system involvement in g. pigs and rhesus monkeys. The adapted virus was proved to be serologically identical with the parent strain.—I. W. B.

I. Levkovich, E. N., Shubladze, A. K., Chumakov, M. P., & Solov'ev, V. D. (1938). Etiologiya vesenne-letnevo epidemicheskovo entsefalita. [**Aetiology of Spring-Summer Encephalitis**].—*Arkh. Biol. nauk.* **52.** 162–183. [English summary]. **1495**

II. Ryzhov, N. V., & Skrynnik, A. N. (1941). O estestvennoĭ zarazhennosti pastbishchnykh kleshcheĭ (Ixodidae) virusom vesenne-letnevo entsefalita. [**On the Natural Infection of Ticks of the Family Ixodidae with the Virus of Spring-Summer Encephalitis**].—*Trud. voenn.-med. Akad. krasn. Armi.* **25.** 27–33]. [English summary]. **1496**

III. Solov'ev, V. D. (1941). O rezervyare virusa vesenne-letnevo entsefalita v prirode. [**On the Reservoir of the Virus of Spring-Summer Encephalitis in Natural Conditions**].—*Ibid.* 95–111. [English summary]. **1497**

I. The virus of spring-summer encephalitis [S.S.E.] was isolated from the blood, spinal fluid, brain, liver, and in one case the spleen of cases occurring in areas where the disease is endemic. The differential characteristics and the biological and immunological properties of the virus are discussed at length.

In animal inoculation experiments, rhesus monkeys and mice were found to be highly susceptible to intracerebral, intraperitoneal, intravenous, and subcutaneous inoculation of the virus. G. pigs were less susceptible, and rabbits, white rats, and pigeons were refractory. The virus survived in the brain of wild rats and mice for 30 days, without producing clinical symptoms or distinct histological lesions in the brain.

The authors consider that this virus is not identical with the viruses of St. Louis encephalitis, of the lethargic encephalitis described by Economo, or of Japanese summer encephalitis.

In its antigenic structure and the high susceptibility of mice, S.S.E. virus most closely resembled the virus of Japanese summer encephalitis; the difference lay in the more complicated structure of the receptor apparatus of S.S.E. virus, since monovalent rabbit antisera of Japanese encephalitis were only partially effective against S.S.E. virus. S.S.E. virus could be differentiated from the St. Louis virus and from lethargic encephalitis (Economo) virus by neutralization tests, as well as by differences in the clinical course and epidemiology of the infections and by differences in the susceptibility of mice.

The authors consider that S.S.E. virus should be placed in the group of seasonal epidemic encephalitis type B viruses.

II. This is one of the many reports made by members of the expedition in the Far East, headed by Pavlovskiĭ, for the investigation of spring-summer encephalitis. The present observations were made in the Oborsk forest in Chabarovsk district where three species of ticks occur—*Ixodes persulcatus*, *Haemaphysalis concinna*, and *Dermacentor silvarum*. The ticks used for experiments were collected from domestic animals, various rodents, and birds, or were collected in the woods in an ungorged condition. To detect natural infection in the ticks, they were fed upon 30 white mice for periods of 1–72 hours and also tick emulsion was inoculated intracerebrally into mice. 612 different ticks were allowed to feed on white mice, with negative results. For the preparation of the various emulsions, 34 groups containing altogether 650 ticks were used; using this method, the authors isolated seven virus strains which proved to be identical with S.S.E.

Three of these strains were isolated from nymphs of *I. persulcatus*, two from mature *I. persulcatus*, one from mature *H. concinna*, and one from a mixture of nymphs and adults of *I. persulcatus* and *H. concinna*. The fact that *D. silvarum* was not found naturally infected cannot be held, in the authors' opinion, as evidence that spontaneous infection does not occur in this species; the transmission of S.S.E. virus by *D. silvarum* under experimental conditions was recorded in previous experiments. The hosts of the infected ticks were the Siberian striped squirrel (*Eutamias sibiricus*), the squirrel (*Sciurus vulgaris mantchuricus*), the hare (*Lepus timidus gichiganus*), the blackbird (*Turdus hortulorum*), and a dog; the authors consider that these animals may act as natural reservoirs for that virus. Naturally infected ticks were also found among those gathered in the wood in an ungorged condition.

III. Observations on spring-summer encephalitis were made during the same expedition [see II] in South Ussuriisk taiga in two areas situated along the river Suputinka and separated from each other by 30 kilometres. One of the places, Saputin Reservation, was known to be an endemic area, the other, Krivoĭ Klutch, to be an area free from infection. Whereas 24 virus strains were isolated from 2,497 *Ixodes persulcatus* ticks collected in the endemic area, not one of 1,800 ticks from Krivoĭ Klutch were found infected. Comparative studies were also made of blood sera of normal human beings, horses, and cattle in both areas; results showed that the sera of inhabitants of the endemic area were highly viricidal. S. considers that this fact is due to hyperimmunization or latent infection caused by repeated bites of infected ticks. He also suggests that the appearance of specific viricidal antibodies in the sera of the population may be of some value in epidemiological prognosis.

Out of 399 wild animals examined in the endemic area, a neurotropic virus was isolated four times (hedgehog, red-grey field vole, and mole), three of the strains being S.S.E. virus. No virus could be isolated from 299 wild animals trapped in Krivoĭ Klutch. The blood sera of all wild animals trapped in the endemic area showed a high content of viricidal bodies. Experimental S.S.E. could be produced in hedgehogs and wolf cubs from areas free of infection, whereas hedgehogs and rodents from the endemic area were resistant to artificial infection, but preserved the virus in the brain for 15 days after intracerebral inoculation. In S.'s opinion it is highly probable that spontaneous cases or even epizootics of S.S.E. occur among certain species of wild animals. Whether these animals act as reservoirs of infection is not yet known. S. emphasizes the important role played by wild animals in the epidemiology of S.S.E. which, in his opinion, is much more important than in Rocky Mountain spotted fever. The epidemiological facts suggest that S.S.E. should be primarily regarded as a disease of wild animals, the path of virus dissemination being tick-animal-tick; this agrees with Pavlovskiĭ's conception of the presence of natural foci of S.S.E.—A. Moldawsky.

Smorodintsev, A. A. (1942). Uspekhi sovetskikh mikrobiologov v oblasti izucheniya virusnykh entsefalitov i grippa. [**Soviet Advances in the Study of Virus Encephalitis and Influenza**].—*Zh. Mikrobiol., Moscow.* No. 11/12. pp. 61–70. **1498**

The progress is discussed of Soviet research on the aetiology, epidemiology, clinical and P.M. findings, prophylaxis, and treatment of the tick-borne spring-summer and autumn encephalitis; the aetiology and prophylaxis of influenza are also discussed.—A. M.

BEDSON, S. P. (1944). **The Present Position with Regard to the Epidemiology of Poliomyelitis.**—*Proc. R. Soc. Med.* **37.** 41–43. Discussion pp. 43–44. **1499**

B. reviewed modern conceptions concerning the transmission of poliomyelitis virus. Until recently, epidemiological and experimental evidence suggested that the nasopharynx was the portal of entry and that air-borne infective droplets were responsible for the spread of the disease. There was, however, one unexplained feature, *viz*, the seasonal incidence of the condition, outbreaks occurring mainly in the late summer and early autumn, and not in the winter and spring when droplet infections are most prevalent.

Recent observations on the recovery of the virus from stools and from sewage samples, together with experiments on the passage of virus from the alimentary tract of monkeys, suggests that the agent may invade the central nervous system from a variety of peripheral starting points and that the throat (tonsil) or intestinal tract may be more important than the nasopharynx.

Subsequent speakers referred to the possibility that flies may act as vectors.—R. E. GLOVER.

FABER, H. K., SILVERBERG, R. J., & DONG, L. (1943). **Poliomyelitis in the Cynomolgus Monkey. I. Comparison of the Upper Portion of the Alimentary Tract with Its Lower, Gastrointestinal Portion as a Portal of Entry, with Special Reference to the Peripheral Ganglia. II. Resistance to Spread of Infection in the Central Nervous System Following Exposures of the Mucous Membranes to Virus with Comments on Non-Paralytic Poliomyelitis.**—*J. exp. Med.* **78.** 499–518 & 519–526. **1500**

I. Poliomyelitis virus was able to penetrate the undamaged mucosae of the mouth and pharynx, but not the mucosa of the gastro-intestinal portion of the alimentary tract. Lesions were found in the peripheral nervous ganglia of 12 monkeys exposed to infection, the ganglia connected with the head alone being more constantly and more severely involved than the coeliac ganglia.

II. Repeated exposure of *Cynomolgus* monkeys to poliomyelitis virus was followed by some degree of resistance to intracerebral inoculation of homologous virus. The resistance, however, appeared to be limited to the power to stop the spread of infection in the central nervous system, rather than to indicate the ability entirely to prevent implantation and proliferation of the virus.—I. W. BROCKLEHURST.

I. MORAGUES, V., & PINKERTON, H. (1944). **Fatal Murine Typhus Infection in the dba Strain of Mice, with Observations on Strain Variation in Susceptibility.**—*J. exp. Med.* **79.** 35–40. **1501**

II. MORAGUES, V., & PINKERTON, H. (1944). **Variation in Morbidity and Mortality of Murine Typhus Infection in Mice with Changes in the Environmental Temperature.**—*Ibid.* 41–43. **1502**

Previous discrepancies in the susceptibility of mice to murine typhus may be explained by (1) differences in the strain of mouse used, and (2) The fact that slight variations in the environmental temperature have a marked influence on the course of the infection. On intracranial injection of 53 dba strain mice (with eleven serial transfers), a 100% morbidity and 53% mortality was obtained, in 33 Swiss mice there was 10% morbidity and no mortality, while in three A. albino mice there was neither morbidity nor mortality. A serially transmissible meningo-encephalitis, similar to that produced in certain virus diseases was demonstrated. After intraperitoneal injection, a uniformly fatal rickettsial peritonitis developed in all of 69 dba strain mice kept at environmental temperatures of 65°–73°F. or 70°–80°F.; with a temperature range of 85°–98°F., a mortality of less than 25% was obtained in 35 mice. Among Swiss, Brown agouti, and A. albino mice injected in parallel series and kept at a temperature of 65°–80°F., the mortality was less than 60%. From these experiments, it appears that the dba strain is much more susceptible to murine typhus than the other three strains studied. The temperatures used in this experiment were not outside the normal seasonal range of "room temperatures", showing the great need for careful control in the work on this disease.—R. COOMBS.

DONATIEN, A., & LESTOQUARD, F. (1940). Du cycle évolutif de quelques *Rickettsia*. **[The Developmental Cycle of Some Rickettsia].**—*Arch. Inst. Pasteur Algér.* **18.** 203–213. [See also *V. B.* **9.** 386]. **1503**

Observations and experiments on *R. conjunctivae* in sheep and *R. canis* in dogs are interpreted as proving that the first stage of rickettsia in the mammalial host is the large homogeneous initial body which undergoes fragmentation to pass through a morula stage, and finally to break up into elementary bodies, which in the case of *R. canis* are assumed to occur in the internal organs. In experimentally infected lambs the initial bodies appeared within 24 hours, but elementary bodies did not appear before the second day after inoculation.
—U. F. RICHARDSON.

See also absts. **1623** (inactivation of influenza virus by soaps), **1653** (rinderpest control).

IMMUNITY

BIRKHAUG, K. (1941). **Allergy and Immunity (Iathergy) in Experimental Tuberculosis. VII. Variations in the Blood Cells of Guinea Pigs Prevented from ever Becoming Allergic during Immunization with BCG-in-solid-Paraffin and during a Virulent Infection.**—*Acta tuberc. scand.* **15.** 59–109. [In English]. [Abst. in *Amer. Rev. Tuberc.* **45.** No. 2. pp. 36–37 of absts., copied *verbatim*]. [For previous parts, see *V. B.* **12.** 284. Part VI not traced]. **1504**

Seventy-five normal guinea pigs were divided into three equal groups. These were called respectively (a) iathergic-immune, (b) allergic-immune, and (c) allergic control. Group (a) and (b) were each inoculated with 100 mg. BCG combined with 1 cc. solid paraffin intramuscularly. The animals of the iathergic-immune group were desensitized by repeated tuberculin injections. Fifty-four days after the BCG-vaccination each of the animals was intraperitoneally injected with 0·0001 mg. human tubercle bacilli. Weekly haematological studies were done in ten animals from each group. The iathergic-immune group showed the smallest and slowest decrease of haemoglobin and erythrocytes. The total leucocyte counts in the allergic-control group fell significantly below those in the other groups. There were no significant differences in neutrophiles, basophiles and eosinophiles. The lymphocytes remained stationary between 31 and 40 per cent in the iathergic-immune group, decreased to 16 per cent in the allergic-immune group, and to 9 per cent in the allergic-control group. The number of monocytes increased in the allergic-immune and allergic-control groups and remained fairly constant in the iathergic-immune group. The Arneth indices of increased immature forms were stationary in the iathergic-immune animals, the allergic-control group showed a

high elevation and the allergic-immune group held an intermediate position. The monocyte-lymphocyte ratio was the most sensitive index for the degree of infection. The Medlar-Crawford leucocytic index seemed to be less sensitive. The results of the haematological studies substantiated the proposition that tuberculo-immunity can exist without tuberculo-allergy.

BARON, B., & BRUNNER, M. (1942). **Active Sensitization in Human Beings with Trichina Antigen.**—*J. Allergy.* **13.** 459–466. **1505**

Larvae of *Trichinella spiralis* obtained from digested muscle of infected rabbits were triturated with sand, and extracted with buffered saline [the pH is not given]. These extracts (nos. 4 and 5) were filtered and used undiluted. Another extract (no. 9) was made by drying the larvae at 37°C., grinding, and extracting with buffered saline for 36 hours at 37°C.

Each of the 18 atopic patients used in the tests was first tested intracutaneously with the no. 9 extract, and gave a negative reaction. They were then given a series of intracutaneous injections of the antigen at intervals of 1–2 weeks, six patients being used to test each of the three extracts prepared. Ten out of the 18 patients developed induced sensitivity as indicated by definite wheal and erythema formation, as early as the third dose in two patients, and varying up to the ninth dose. In further experiments, attempts were made to transfer this induced sensitivity to normal non-atopic non-trichinella-reactive individuals by injecting serum from the sensitized individuals into the skin at several prepared sites on the arm. These sites were tested with the antigen 3–7 days after the injection, and control tests were always performed on the adjacent skin. Out of 57 tests performed in this way 61% were weakly positive and 16% definitely positive. Skins injected with these sera were also tested with an *Ascaris* antigen [method of preparation not given], and of the 17 tests performed 41% were weakly positive and 18% definitely positive. A few tests were also made with sera obtained from patients actively sensitized to the *Ascaris* antigen, using both *Trichinella* and *Ascaris* antigens in the skin tests. Of 17 tests with *Ascaris* antigen on *Ascaris* sera, only one (6%) was negative, three (18%) were weakly positive, while of ten tests with *Trichinella* antigen on *Ascaris* sera only one was weakly positive and one definitely positive.—D. G. GILMOUR.

HUMPHREY, J. H. (1943). **Antigenic Properties of Hyaluronic Acid.**—*Biochem. J.* **37.** 460–463. **1506**

Hyaluronic acid was coupled chemically to horse serum albumin and to normal rabbit serum by azobenzyl ether linkage; the former compound was used for immunizing rabbits and the latter as test antigen. Serological tests showed that the coupled hyaluronic acid did not act as a specific hapten.—R. ALLCROFT.

FRASER, D. T., MACLEAN, D. L., ORR, M. D., PLUMMER, H. C., & WISHART, F. O. (1943). **Tetanus Toxoid and Its Use for Active Immunization.**—*Amer. J. publ. Hlth.* **33.** 1107–1114. **1507**

Useful information was obtained about the height and duration of the antitoxin response from tetanus toxoid in young adults. Three doses within a period of six weeks produced a better and more durable response than did two doses. Studies were also made using tetanus toxoid incorporated with TAB vaccine and it appeared that the activity of the toxoid was thereby enhanced. One or more stimulating doses of toxoid given at intervals of 3–6 months after the primary course were shown to be very desirable for increasing and maintaining a satisfactory level of antitoxin.—J. K.

LAHIRI, D. C. (1942). **A Mouse-Protection Test for the Assay of Tetanus Toxoid.**—*Indian J. med. Res.* **30.** 371–379. **1508**

A mouse protection test, which can be used for differentiating between a useful and a useless toxoid, is described. It consists in injecting subcutaneously 30 or more mice of standard weight with toxoid equivalent to half the human dose. Four weeks later they are tested by the subcutaneous injection of 20 lethal doses of toxin. If at least one-third of the mice live for five days the toxoid is held to be sufficiently potent.

—V. R. RAJAGOPALAN.

WADSWORTH, A. B., & CROWE, M. O'L. (1943). **The Spectroscopic Investigation of Bacterial Toxins. II. The Ultraviolet Absorption Spectra and Florescence of Synthetic Products in Toxigenic and Nontoxigenic Diphtheria Cultures.**—*J. infect. Dis.* **73.** 106–123. [For previous article, see *V. B.* **5.** 833]. **1509**

This quantitative spectrophotometric study included the ultra-violet absorption by the synthetic products of the toxigenic and non-toxigenic diphtheria bacilli, which were present in ultrafiltered residues and purified fractions. No very close relationship was noted between the intensity of the spectral absorption at the band maxima and the toxicities of the material. The band maximum of the absorption spectrum curve for pure diphtheria toxin, purified by ultrafiltration, was tentatively set at about λ 2,740 Å. Flavin, porphyrins, pterin-like pigments, a pigment resembling melanin, and two substances having selective absorption, one near the band maximum for tyrosine and the other near that for nucleic acid, were also recognized in the ultrafiltrates and residues.—I. W. BROCKLEHURST.

I. PIGOURY, L. (1943). Les sérums précipitants préparés chez le lapin par injection de protéines musculaires sont-ils spécifiques? **[The Specificity of Precipitating Sera Produced in Rabbits by the Injection of Muscle Proteins].**—*C. R. Soc. Biol. Paris.* **137.** 220–221. **1510**

II. PIGOURY, L. (1943). Obtention, par "épuration des anticorps", de sérums précipitant les protéines musculaires crues ayant une spécificité absolue. **[Preparation of Specific Sera for Precipitating Crude Muscle Proteins].**—*C. R. Soc. Biol. Paris.* **137.** 221–222. **1511**

I. A discussion of doubtful results obtained by the use of precipitating rabbit sera for the determination of the animal of origin of meat products.

II. A method is described for rendering precipitating sera specific for the suspected animal of origin.

See also absts. **1446** (vaccination against brucellosis), **1452** (toxins of *Cl. welchii*), **1442**, **1443** (genetic resistance to mouse typhoid), **1473** (c.-f. test for typing F. and M. disease), **1657** (studies on immunization).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

*GEERTSEMA, G. (1942). De bestrijding van de runderhorzel. **[Control of Warble Flies].**—*Tijdschr. Diergeneesk.* **69.** 611–614. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **143.** 458]. **1512**

After 15 years' experience, G. favours mechanical removal of the larvae for the control of warble flies. Animals are treated from the end of March to the beginning of June. The larvae are pricked through the warble hole by means of a pointed scalpel or the point of a scissors. The larval contents escape and they can

be removed by pressure through a very small aperture. [It has frequently been reported that accidental rupture of the larva during mechanical removal has provoked an anaphylactic reaction ("rose fever") in the host, particularly in older animals. The danger of such reaction should be borne in mind in applying the present technique.—ED.]—T. E. GIBSON.

SOUTO, G. G. (1943). Miiases nas aves. **[Myiasis in Poultry].**—*Bol. Soc. brasil. Med. vet.* **12.** 25–30. **1513**

S. gives a résumé of reports of myiasis of poultry in Brazil. In most cases the parasite was *Cochliomyia hominivorax* [= *C. americana*]. He observed cases in which the predisposing cause was diarrhoea due to faulty diet: the diarrhoea caused the shedding of feathers round the cloaca and the scalded skin was then attacked by the flies.—MILLER WATSON.

CHORLEY, J. K. (1943). **Tsetse Fly Operations, 1942. Short Survey of the Operations by Districts for the Year Ending December, 1942.**—*Rhod. agric. J.* **40.** 174–177. **1514**

During 1942, it was discovered that the westward advance of *Glossina morsitans* had continued, and that a heavy concentration of this fly was now present in Portuguese East Africa only six miles over the Rhodesian border, whilst a number of specimens were taken within half a mile of the border. Also during this year it was discovered that *G. pallidipes* occurred in the northern fly belt where it had been considered that only *G. morsitans* existed. Fairly heavy losses of stock have occurred in the Wankie district which, it is suggested, may be due to the spread of *G. pallidipes*. Two cases of human trypanosomiasis were discovered in the Lomagundi area, the first cases recorded from this fly belt.

Reports are given of the progress of control measures in the various fly belts of Northern Rhodesia, together with notes on the health of stock in areas where reclamation work is in progress.—U. F. RICHARDSON.

—. (1943). Exhortación de la Dirección de Ganadería. Las balneaciones de post-esquilas contra la sarna ovina. **[Appeal by the Division of Livestock for the Control of Sheep Scab by Dipping after Shearing].**—*Bol. mens. Direcc. Ganad., Montevideo.* **27.** 295–296. **1515**

This appeal by the Livestock Division of the Uruguayan Ministry of Agriculture calls on all breeders of sheep to carry out triple dipping after shearing to prevent sheep scab. The dippings should be carried out at intervals of 10–12 days even when scab is not suspected.—MILLER WATSON.

*YAKUSHIN, V. G. (1940). **[Biology of *Psoroptes communis* var. *cuniculi* and Epizoology of Rabbit Mange].**—*Trud. Kirov. zootekh. vet. Inst.* **4.** 210. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* Oct. 30th. 326. (1942)]. **1516**

Eggs of *P. communis* var. *cuniculi*, when placed in a moist chamber at 38°C., together with a piece of infected skin from which all mites and larvae had been removed, hatched in 12–72 hours. Eggs do not hatch in the absence of a piece of infected skin, nor will they hatch if kept at room temperature in daylight, although the infected skin is present. In the outer ear of the rabbit, larvae require ten days to give rise to sexually mature females. The resulting mites, if kept on skin and in darkness at room temperature will live about three weeks, but if exposed to daylight die within 17 days. Attempts failed to establish infection with this mite in dogs, white mice, and human beings.

Rabbits with mange were found to recover from the disease without special treatment provided that they were kept in airy, well illuminated hutches with fresh grass and oats to eat, and were supplied with clean drinking water.—J. B. CRAGG.

See also absts. **1496**, **1497** (ticks as vectors for spring-summer encephalitis).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

BARNETT, L. (1941). **Control of Hydatids. Country Dog Owners Must Assist in Checking the Disease.**—*N.Z. J. Agric.* **63.** 413–414. **1517**

In view of the discouraging results following years of intensive and systematic propaganda to educate people in the control of hydatid disease, B. emphasizes the need for something more than persuasive measures if the spread of the disease is to be checked. He feels strongly that the slight risk of idiosyncrasy in dogs dosed with the official anthelmintic, arecoline, should not be allowed to hamper the Government campaign against a disease which has such far-reaching effects on the human population. He points out that the value of condemned sheep and cattle livers is about £400,000 annually, and speculates as to the propaganda value of paying farmers more for carcasses with clean livers.
—M. B. BUDDLE.

GELORMINI, N. (1939). Cysticercus cellulosae y Cysticercus ovis. [*C. cellulosae* **and** *C. ovis*].—*Inst. Parasit., Fac. Agron. Vet., Univ. B. Aires.* **1.** No. 4. pp. 11. **1518**

This is a description of *Taenia solium* and *T. ovis* and their respective cysticerci. Illustrations are given to facilitate differential diagnosis.—MILLER WATSON.

PERRIN, T. G. (1942). Algunos estudios sobre triquinosis ignoradas. **[Cases of Unsuspected Human Trichinosis in Mexico].**—*Rev. med. trop. parasit., Habana.* **8.** 59–64. **1519**

P. examined P.M. the diaphragms of 200 human beings who had died from other causes and had no history of trichinosis. He found larvae of *T. spiralis* in 25, or 12·5%.

Using an antigen prepared by the method of BOZICEVICH [*V. B.* **11.** 33.] in apparently healthy human beings, he obtained 14·4% positive reactions.
—MILLER WATSON.

*GIESSMANN, W. (1939). Beiträge zum Studium der Fuchstrichinose mit besonderer Berücksichtigung der Übertragungsmöglichkeit der Fuchstrichine auf das Schwein. **[Fox Trichinosis and the Possibility that it is Responsible for Infection of Pigs].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Schweiz. Arch. Tierheilk.* **85.** 375]. **1520**

In wild foxes infection with trichinae is frequent, but it is not certain whether foxes are a source of trichinosis in pigs. In addition to carnivores and pigs, susceptible animals include rabbits, hares, g. pigs, lambs, calves, foals, and even birds. In the pig the trichina capsules are oval or lemon-shaped whilst in foxes they are spherical. G. found that trichinae from foxes were infective for both pigs and g. pigs. Field mice examined were free from trichinosis, but in six foxes and one badger circular capsules were abundant.
—T. E. GIBSON.

ALLENSPACH, V. (1943). Trichinen bei Füchsen. **[Trichinosis in Foxes].**—*Schweiz. Arch. Tierheilk.* **85.** 380–382. **1521**

A. considers the problem of trichinosis in foxes in

Switzerland from the public health viewpoint. Although fox flesh is used as food by the population of some regions, the fox was not classified as game according to the meat inspection orders of 26th August, 1938. Fox flesh used as food was not generally purveyed through trade channels and was not subjected to meat inspection. A survey of the incidence of infection in game and other animals showed that there is a considerable danger of spread from these sources. The fox is known to be a carrier of trichinosis and the spread of the disease in Central Europe is due to foxes and other carriers in game reserves, rather than to the pig and rat. Accordingly, by an order from the Federal Political Economy Department dated 2nd November, 1942, the fox was classified as game within the meaning of article 102 of the 1938 meat inspection regulations. This order requires that fox flesh shall be examined for trichinae, and lays down that it shall not be consumed until a certificate of freedom from trichinae has been granted. The order also regulates the sale of fox flesh in catering establishments. In the Canton of Zurich, a laboratory examination of muscle from the diaphragm has to be carried out before a certificate of freedom from trichinae is given. During the year 1942–43, 61 specimens were examined in the laboratory under this provision and six (about 10%) were found to be infected with trichinae. Although about 1,000 foxes are shot annually in the Canton of Zurich and a large proportion of their flesh is used as human food, only about 2·4% are submitted for examination for trichinae. The public evidently do not realize the danger of infection with trichinosis which may result from the consumption of fox flesh.—T. E. G.

*Schade, M. (1939). Über Trichinen und andere Parasiten des Rotfuchses in Kurhessen und angrenzenden Kreisen. [**Trichinae and other Parasites of Red Foxes in Kurhessen and Neighbouring Territory**]. —*Inaug. Diss., Hanover.* [Abst. from abst. in *Schweiz. Arch. Tierheilk.* **85.** 374]. **1522**

S. examined 260 red foxes and found 4·6% of them to be infected with trichinae, which were most abundant in the pillars of the diaphragm and were found in smaller numbers in the intercostal, abdominal, masseter, and tongue muscles. The assertion that fox trichinosis arises from field mice was not confirmed, as 794 field mice were examined for trichinae and none was found infected. Trichinosis in red foxes and other wild species, *viz*, badgers, wild boars, and bears arises most commonly from refuse heaps containing infective material. In two cases domestic pigs were infected with trichinae by eating red fox flesh. The trichina capsule is generally round in the red fox, less often it is oval in shape and rarely it is an elongated oval shape.

Of the 260 red foxes examined, 22 were free from parasites. Parasites of the lung, intestine, and urinary bladder occurred most commonly. The chief intestinal parasites were tapeworms, *Mesocestoides* sp. in 130 and *Taenia pisiformis* in 31 cases. Hairworms (*Capillaria* sp.) were found in the intestine and urinary bladder. The frequency of parasites in red foxes is a danger to fox farmers should wild foxes enter their premises. —T. E. Gibson.

*Moritz, W. (1939). Ist die Trichinose der Füchse auf Trichinelleninfektion der Feldmäuse zurückzuführen? [**Are Field Mice the Source of Trichinosis in Foxes?**]—*Inaug. Diss., Hanover.* [Abst. from abst. in *Schweiz. Arch. Tierheilk.* **85.** 375]. **1523**

M. reviews the literature on trichinosis, noting all the important findings since the discovery of the parasite by J. Hilton in 1832. A discussion of the zoological position and an account of the development of the worm are given and are accompanied by copious references. M. reviews all the records of trichinosis in foxes and notes that the incidence is high in some regions. The results of his own investigations are summarized in brief tables: he found a low level of infestation in mice from a region where fox trichinosis is prevalent and concludes that it is not likely that fox infestation arises from mice.—T. E. Gibson.

Oldham, J. N., & White, E. G. (1944). **Chronic Focal Interstitial Hepatitis in the Pig: Its Experimental Production by Feeding *Ascaris* Eggs.**—*J. comp. Path.* **54.** 1–15. **1524**

Fuller details of preliminary experiments and results of further experiments are presented to support the view that "milk spot liver" is caused by migrating *Ascaris* larvae [see also *V. B.* **12.** 293 & 456]. In all, 20 pigs, aged 8–11 weeks, were fed 200,000–400,000 embryonated *A. lumbricoides* eggs. Eighteen of the pigs were killed at varying intervals, ranging from 18½ hours to 30 days, after a single feed. The remaining two pigs received the eggs in ten smaller doses at weekly intervals; one was killed four days after the last dose and the second was given a further large dose and was killed six days later. Blood films for eosinophile counts were made at the time of slaughter in the first series of experiments, and at the time of feeding as well as at slaughter in the second series. P.M. procedure included histological examination of liver, lungs, and kidneys, extraction of larvae from minced lungs and liver by means of a Baermann apparatus, examination of the peritoneal and thoracic cavities, tracheal washings in some cases, and a faecal examination for helminth eggs. Experimental feeding produced lesions identical with the various types found in naturally occurring "milk spot liver". Pigs given a single large dose of eggs showed a marked eosinophilia after 24 hours, which reached its maximum at 10–20 days. The development and time relations of eosinophilia were similar in pigs given small repeated doses, but only the initial dose appeared to cause a rise in the eosinophiles, the level of which returned to normal in 4–5 weeks. Emphasis is placed upon the necessity for the widespread adoption of control measures to reduce the economic losses associated with *Ascaris* infection in swine.—M. L. B.

Dederko, V. M. (1940). Vliyanie produktov raspada askarid (Parascaris equorum) na vysshuyu nervnuyu deyatel'nost' sobaki. [**Effect of Disintegration Products of *Parascaris equorum* on Conditioned Reflexes in Dogs**].—*Trud. Troitsk. vet. Inst.* No. 3. pp. 285–294. **1525**

When *Parascaris equorum* extracts in small doses were introduced parenterally into dogs, the conditioned salivation reflex was inhibited for 1–2 days and reverted to the normal after 4–6 days.—A. Moldawsky.

Shorb, D. A. (1943). **Survival on Grass Plots of Eggs and Preinfective Larvae of the Common Sheep Stomach Worm, *Haemonchus contortus*.**—*J. Parasit.* **29.** 284–289. **1526**

S. studied the survival of *H. contortus* larvae on specially sown grass plots at the Beltsville Research Center, Maryland. Faeces containing eggs were placed on the plots at the onset of cold weather in December 1936, and in February and March 1937. Cultures were made from samples of the same faeces and examined after two weeks' incubation at room temperature. No larvae were recovered when the plots were examined in April and May, although 54,000–1,200,000 larvae were recovered from the 100 g. of faeces used for the cultures. S. has shown [(1943). *J. agric. Res.*—not available in United Kingdom.] that infective *H. contortus* larvae can survive the winter and concludes, therefore, that

it was the pre-infective larvae and eggs which were destroyed by the winter climate in this experiment.

In a second experiment, 50 g. of faeces were placed on two sub-plots (one-quarter of a full plot) on August 5th, 1937, and two weeks later 376 larvae were recovered from the grass and 988 from the top 1″ layer of soil. After removal of the grass and the soil, 100 g. of a four-day-old culture were added to each sub-plot. One week later, only 21 larvae were recovered from this culture material and from the top 1″ layer of soil, whilst a control plot (with grass growing) yielded 6,070 larvae. Sunshine and heat are, therefore, lethal to the second- and third-stage larvae of *H. contortus* exposed in faeces on bare ground in August, whilst adequate grass cover favours their survival.

In a third experiment, the faeces were applied to five plots as whole pellets, crushed pellets, or watery paste. One sub-plot in each of the plots received one quart of water per day, one received one-third of a quart daily, one received one-third of a quart weekly, and one received no water beyond the natural rainfall. Twenty-four times the number of larvae were recovered from the first sub-plot as from that receiving no additional water, and those sub-plots receiving smaller additions of water showed a proportionately smaller number of larvae surviving. The difference was due to the added water being more constantly present than the rain. Alteration in the consistency and concentration of the faecal matter on the pasture was seen to alter the conservation of moisture, and thus to affect the survival rate of the larvae. The experiment illustrates the danger of a wet season and of the concentration of faeces on the pasture, in favouring the survival of larvae. Lambs should therefore be managed so that there is no undue concentration of faeces around feeding and watering places, and they should be moved to clean pastures following very wet periods.—T. E. GIBSON.

See also absts. **1616**, **1617** (anthelmintics).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

DMOCHOWSKI, L., & GYE, W. E. (1943). **Influence of Cross-Suckling on the Incidence of Mammary Cancer in High and Low-Cancer Strains of Mice.**—*Brit. J. exp. Path.* **24.** 223–226. **1527**

Foster nursing of female mice of a high cancer strain by females of a low cancer strain reduced the incidence of mammary cancer from 83% to 6·6%. Conversely, foster nursing of female mice of a low cancer strain by females of a high cancer strain, increased the incidence of cancer in the former from 1% to 29·6%.
—I. W. BROCKLEHURST.

KAHLER, H., BRYAN, W. R., & SIPE, H. M. (1943). **Ultracentrifugal Studies of some Complexes obtained from Mouse Milk, Mammary Tumor, and other Tissues.**—*J. nat. Cancer Inst.* **4.** 37–45. **1528**

This is a comparison by the differential centrifugation method of the chief components showing sedimentation values between 25s and 200s, of spontaneous mammary tumours, normal chick embryos, Jensen rat sarcoma, milk of high tumour strain and low tumour strain mice, unpasteurized cow's milk, and human mammary carcinoma.

Ultra-violet absorption spectrograms and biochemical tests indicated the presence of a ribose nucleic acid complex in material from a spontaneous mouse mammary carcinoma.—I. W. BROCKLEHURST.

WICKWARE, A. B. (1943). **Transmissible Leucosis. A Recently Isolated Strain.**—*Canad. J. comp. Med.* **7.** 265. **1529**

In recent studies of the blood of Barred Rock cockerels a strain of leucosis, which is readily transmissible, was discovered in three birds. This strain gives evidence of having a single aetiological agent which stimulates primitive blood cells to unrestricted growth with a flooding of the circulation. The period of incubation, following the first passage, averaged 45 days; in subsequent passages this was reduced to 30 days, with successful "takes" varying from 43–50%. The disease has been carried through five generations of chickens of various breeds by intravenous transfusions of heparinized whole blood and in each generation the blood picture has been that of a true erythroleucosis. Intramuscular injection of heparinized whole blood and saline-suspended tissue extracts have shown no indication of an ability to produce neoplasms at the site of inoculation.—THOS. MOORE.

CLAUDE, A., & POTTER, J. S. (1943). **Isolation of Chromatin Threads from the Resting Nucleus of Leukemic Cells.**—*J. exp. Med.* **77.** 345–354. [Authors' summary copied *verbatim*]. **1530**

1. A method for the separation of chromatin threads from the resting nucleus of leukemic cells has been described.

2. The isolation of the chromatin strands was accomplished by purely mechanical means, and the separation, including extraction and purification in the centrifuge, required only about 1 hour.

3. Evidence is presented to show that the chromatin strands are morphologically related to the chromosomes, if not identical.

4. It seems probable that, by the present technique, chromatin strands can be obtained from different mammalian tissues for direct microscopical examination and biochemical analysis.

BIELEY, J. (1943). **The Avian Leucosis Complex. A Note on Avian Osteopetrosis.**—*Canad. J. comp. Med.* **7.** 276–279. **1531**

A case of osteopetrosis is described. Marked changes were found in the bones, particularly in the lower limbs. No lesions were present in the viscera.

B. states that since 1936 the condition has been discovered in six birds, three males and three females, representing five flocks. In three of the five flocks, manifestations of lymphomatosis were observed and this was confirmed by P.M. examination.
—THOS. MOORE.

BRONSON, L. H., & PARKER, R. F. (1943). **The Inactivation of the Virus of Infectious Myxomatosis by Heat.**—*J. Bact.* **45.** 177–181. **1532**

Inactivation of a virus by heat is not accomplished abruptly, nor is a virus which is able to "withstand" one temperature necessarily destroyed by another higher temperature. At both temperatures some virus may be inactivated, the rate of inactivation being related to temperature in a linear fashion. This reaction is one of the first order and can be equated as follows :–

$$R = \frac{2 \cdot 303}{t} \log \frac{Co}{C}$$ where R = rate of deterioration in unit time, t = time of heating, Co = concentration of virus at the beginning of the period, and C = concentration of virus at the end of the period of heat.

As the amount of virus inactivated in a given time is a fraction of the amount present at first, infinite time should be needed for complete inactivation. Although this does not hold in practice, it does take longer to inactivate much virus than a small amount.—D. L. H.

DISEASES, GENERAL

ROGICK, F. A. (1943). Defesa sanitária animal. [**Protection of Animals against Disease**].—*Bol. Soc. brasil. Med. Vet.* **12.** 109–119. **1533**

A general article dealing with preventive and curative veterinary medicine.—MILLER WATSON.

—. (1942). Reglamento de exposiciones ferias y remates de ganado de 7 de Octubre de 1942, que contiene disposiciones referentes a investigación de brucelosis. [**Regulations to Control Diseases in Animals at Exhibitions etc., Uruguay**].—*Bol. mens. Direcc. Ganad., Montevideo.* **26.** 297–304. **1534**

These regulations for the control of animal diseases in Uruguay include the inspection of markets, showgrounds, and exhibition premises and control their size. Compulsory dipping of animals before being sent to such places is instituted. Animals destined for sales or exhibitions must be accompanied by a veterinary surgeon's certificate stating that the animal has been tuberculin tested, vaccinated against anthrax, and has given a negative brucellosis reaction. Poultry must be certified as tested for pullorum disease.—M. WATSON.

MULLINS, J. (1943). **Staggers in Animals.**—*N.Z. J. Agric.* **66.** 227. **1535**

Ryegrass staggers, paspalum staggers and grass staggers are briefly described in sheep, horses, and cattle.—M. B. BUDDLE.

BOGOLYUBOV, A. A. (1940). "Kovyl'naya bolezn'" u loshadeĭ v Yuzhnom Zaural'e. (Predvaritel'noe soobshchenie). [**"*Kovyl'* Disease" in Horses in South Ural Caused by *Stipa* Grass. Preliminary Report**].—*Trud. Troitsk. vet. Inst.* No. 3. pp. 126–134. **1536**

The condition occurs in Kazakhstan and western Siberia in horses, cattle, and sheep fed on various varieties of *Stipa* grass and hay, which are valued locally for their nutritional value and for flavouring mare's milk used for the preparation of koumiss. Owing to the peculiar barbed structure of the seed pods they penetrate the skin and muscles and reach vital organs, causing considerable losses among sheep. In horses and, more rarely, in cattle the disease is manifested by injuries of the oral mucous membrane, pharynx etc., causing fistulae. The lesions in the horse are discussed. In severe cases the teeth may be affected and even the mandibular articulation. The seed pods sometimes penetrate the cranium through the foramen lacerum, and cause illness simulating epidemic encephalitis. The course of the condition may be prolonged for months and even years, ending in emaciation and death. Prophylactic measures are discussed. Seven instructive photographs are included.—A. MOLDAWSKY.

*SIOEN, D. (1941). [**Paralysis of Epizootic Character in Horses**].—*Vlaam. Diergeneesk. Tijdschr.* **10.** 190–192. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 331]. **1537**

At the end of August, 1941, an explosive outbreak of paralysis occurred in horses in the neighbourhood of Louvain. Symptoms developed rapidly. In most cases the animals died after 2–8 days. Two days before the manifestation of typical symptoms, haematuria was observed in one case. Body temperature, appetite, and defaecation were unaffected.—ALASTAIR N. WORDEN.

—. (1943). **Bloat in Cattle and Sheep. Recommendations for Prevention.**—*Canad. J. comp. Med.* **7.** 273–275. **1538**

Under certain feed conditions, gas, produced by the processes of fermentation, is not expelled by belching. This condition occurs more frequently in animals on legume pastures than on grass. The irritating surfaces of grasses are thought to facilitate belching and animals seldom bloat when on a pasture composed of at least 50% grasses. Experiments indicate that cows fed Sudan hay at night will not bloat when on a legume pasture in the day. The effectiveness of this method of prevention depends upon whether or not sufficient hay is consumed. [See also abst. 1546.]—P. J. G. P.

MORRILL, C. C. (1943). **Infectious Rhinitis in Swine.**—*N. Amer. Vet.* **24.** 606–607. **1539**

M. describes this disease of swine and illustrates by photographs the deformity of the facial bones which occurs through necrosis and suppuration involving the sinuses, meninges, and the ethmoid bone. DAUGHERTY [*V. B.* **11.** 707.] has reported *Brucella bronchoseptica* as a possible cause and M. now suggests that *Fusiformis necrophorus* may cause many of these outbreaks of so-called "bull nose" and that *Pseudomonas pyocyanea* may act as a secondary invader.—C. V. WATKINS.

STEENERSON, T. L. (1943). **Enteric Problems in Swine.**—*N. Amer. Vet.* **24.** 603–605. **1540**

S. chiefly discusses the dietetic aspect of these problems and states that, apart from *Salmonella cholerasuis* infection and infectious haemorrhagic dysentery, enteritis is rarely noted in properly fed pigs.

He gives recommendations for the feeding of pigs of all ages, and criticizes food manufacturers for incorporating many ingredients unsuited for pigs in their mixtures. He advocates free choice of diet for pigs and states that the animals will then rarely overfeed on any one item.

The treatment advised for infectious haemorrhagic enteritis includes feeding oats soaked 12 hours in saline with sodium bicarbonate (or commercial "alkaline powder"), the exact proportions not being stated. Should this be refused individual pigs should be dosed by stomach tube with equal parts of common salt and sod. bicarb. 0·25 oz. per 50 lb. live weight daily. Water must be available always.—C. V. WATKINS.

BENDAYÁN, J. P. (1943). Contribución al estudio de la patología hepática del caballo. [**Contribution to the Study of the Pathology of the Equine Liver**].—*Gac. vet., B. Aires.* **5.** 154–171. **1541**

B. reports a number of cases of hepatic affections of the horse. These include jaundice, colic, impaction, and indigestion as the visible symptoms. He considers, especially, that biliary insufficiency has not been paid enough attention as the cause of impaction.—M. W.

SCHLOTTHAUER, C. F. (1943). **Diseases of the Nervous System of Dogs.**—*N. Amer. Vet.* **24.** 608–614. **1542**

S. deals mainly with the diagnosis of diseases which may cause fits, convulsions, or paralysis and mentions the aetiology and pathology of the more common forms.

The article is arranged according to the many regional nervous disorders which may occur, dealing with lesions produced and differential diagnosis, and does not lend itself to abstracting.

Some of the theories concerning the causation of certain nervous diseases of dogs, deficiency of trace elements and other diseases of dietetic origin, with or without parasitism, are mentioned. The various means of inducing epileptiform convulsions in dogs, *viz*, by freezing, electrical shock, viruses (distemper and Western type equine encephalomyelitis), and several drugs (insulin, metrazol, etc.) serve to emphasize the complexity of correct diagnosis.—C. V. WATKINS.

MARCATO, A. (1942). Sulla calcolosi renale della specie bovina. Lesioni locali—alterazioni paratiroidee. [**Renal Calculi in Cattle**].—*Nuova Vet.* **20.** 100–115. **1543**

M. studied the parathyroid glands of 35 cattle which had suffered from renal calculi, and compared them with glands from 21 normal animals.

He found the parathyroids of affected animals to be hypertrophied and, although the cellular structure was normal in type, there was marked hyperplasia. He suggests that abnormal parathyroid activity producing alteration in calcium metabolism was the cause of the renal calculi.—MILLER WATSON.

WHITE, E. G. (1944). **Urinary Calculi in the Dog, with Especial Reference to Cystine Stones.**—*J. comp. Path.* **54.** 16–25. **1544**

A series of urethral, vesical, and renal calculi from 103 dogs was submitted to a simple and rapid method of qualitative chemical analysis, described in detail, capable of detecting the main constituents. The gross characters of various types of calculi are described, and illustrated in photographs. Vesical calculi usually consisted of phosphate, and were most common in the female. Urethral calculi were present alone in 31 cases, all male dogs; they were usually multiple, and in 17 cases were composed mainly of cystine, suggesting that cystinuria was commoner in the dog than had formerly been supposed; there is a considerable discussion of cystinuria in the dog.

The importance of chemical analysis of stones removed at operation, with a view to instituting any treatment calculated to prevent their recurrence, is stressed. For example, rendering the urine more acid might be of value in preventing recurrence of phosphatic calculi, but would probably render more likely the formation of cystine stones in dogs with cystinuria.—E. COTCHIN.

MENKIN, V. (1943). **Chemical Basis of Injury in Inflammation.**—*Arch. Path.* **36.** 269–288. **1545**

A factor is identified, named necrosin, in the euglobulin fraction of exudate from damaged tissues from man or dogs, which is apparently responsible for the characteristic features of inflammation (redness, oedema, superficial necrosis, and lymphatic blockade). The typical appearance of inflammation was produced by injection of the euglobulin fraction of wound exudate. Other protein fractions from wound exudate were inactive, as was also the euglobulin fraction from normal serum. The euglobulin fraction from the serum of the general circulation of an animal with localized inflammation, however, was active, thus indicating that necrosin circulates in the bloodstream.

The fact that whole wound exudate caused a reaction indicated that the effect was not attained by means of the chemical procedure for the isolation of the euglobulin fraction. The possibility of the effect being one of a foreign protein only was eliminated, since dog necrosin was active upon dogs as well as upon rabbits. The material from exudate on injection into dogs caused a fairly prolonged rise in body temperature; it caused no rise in the blood pressure of a cat; it caused an immediate leucopenia but a delayed leucocytosis; some injury to the liver and to a lesser extent to the kidneys was observed.—RACHEL MARSHALL.

See also absts. **1565** (heart murmurs in horses), **1524** (focal interstitial hepatitis in pigs), **1632** (sublimate test for diagnosis of various diseases).

NUTRITIONAL AND METABOLIC DISORDERS

COLE, H. H., & MEAD, S. W. (1943). **A Physical Deficiency in the Ration of Ruminants.**—*Science.* **98.** 543–544. **1546**

Evidence is adduced that, in the case of ruminants, deficiencies in a concentrate ration may be entirely physical in nature. In experiments with cows and ewes, finely ground lucerne hay was compared with whole lucerne hay, each being given with approximately equal proportions of a concentrate mixture comprising rolled barley, 60; wheat bran, 25; soybean meal, 12·5; NaCl, 2·5. The rations were fed *ad libitum* over a period of approximately eight hours daily.

In the cows receiving the finely ground hay, rumination occurred irregularly or was in abeyance, food consumption was reduced by approximately 6·9 lb. daily (as compared with the animals receiving whole hay), there were frequent attacks of bloat, and wood chewing was observed. These symptoms were relieved on replacement of the ground hay by whole hay. The reduction in food consumption during the period in which finely ground hay was fed caused bouts of inappetence following the consumption of large amounts of the diet.

In the ewes, symptoms were less pronounced, food consumption was not lowered during the period when finely ground hay was fed, and only a single case of bloat occurred. Rumination was, however, irregular.—ALASTAIR N. WORDEN.

BLAKELY, A. A., & DEWES, D. F. (1942). **Molasses Will Reduce After-Calving Complaints.**—*N.Z. J. Agric.* **64.** 161–164. **1547**

The abundant supply of molasses as a beneficial feed supplement to dairy herds to reduce after-calving complaints is recommended following wide experience of its use by the authors.—M. B. BUDDLE.

UDALL, R. H. (1943). **The Digestibility of Starch in the Cat Family with Special Reference to the Effect of Freezing.**—*Cornell Vet.* **33.** 360–364. **1548**

Digestive trials were carried out using Californian bob-cats (*Lynx rufus*) and domestic cats (*Felis domesticus*). Pumas (*L. concolor*) proved unsuitable experimental animals owing to their fastidious feeding habits. Collections of faeces were made over five- or six-day feeding periods, following short preliminary periods. The results suggested apparent digestibilities as follows:—frozen maize starch, 55%; unfrozen maize starch, 41%; potato starch (frozen or unfrozen), 25–30%. Diarrhoea occurred on the frozen maize starch diet.—ALASTAIR N. WORDEN.

WIERDA, J. L. (1943). **Diverticula of the Colon in Rats Fed a High Fat Diet.**—*Arch. Path.* **36.** 621–626. **1549**

Eight rats were fed from weaning on a high-fat diet (butter fat, 55; casein, 25; cod liver oil, 7; dry yeast, 7; salt mixture, 6). Five were killed at 25 weeks of age, and showed no diverticula. The three remaining animals were killed after receiving the diet for 90–111 weeks, and in each of them colonic diverticula were present. The gross appearance of the diverticula resembled that of the type found in the human colon. Histologically, they were seen not to be herniations of the mucous and submucous layers of the colon through the muscle layers, since the wall contained a thick muscular component. W. was unable to find any previous reference to the occurrence of such diverticula in the rat or in any species but man.—A. N. WORDEN.

—. (1943). **Bibliography of References to the Literature on The Minor Elements and Their Relation to Plant and Animal Nutrition. Fourth Supplement to the Third Edition.** pp. 92. New York: Chilean Nitrate Educational Bureau, Inc. [4to]. **1550**

This fourth supplement contains about 700

abstracts and forms a very useful addition to the previous parts [see *V. B.* **13.** 365, absts. 2447–2451]. The general index and author index in this supplement differ from those of previous supplements and editions in that the names of all authors shown in the original papers have been included, whereas in previous publications only the name of the first author was given.

—R. ALLCROFT.

MCINTOSH, R. A. (1943). **Goitre of the Newborn.**—*Canad. J. comp. Med.* **7.** 263–265. **1551**

Goitre of the newborn is a congenital disease believed to be due to lack of iodine in the prenatal diet. It occurs in all species of domesticated animals but the manifestations are different. In pigs, the young are often stillborn and hairless, their necks are thickened and the carcass flabby fat. The mortality in lambs is not as great as in pigs; the wool growth is very poor and some areas may be denuded. In calves there is usually a very large swelling in the angle of the neck; they are weak but may survive and recover. The condition is not common in horses, but affected foals lack vitality and resistance to other diseases. The condition is prevented by providing iodized salt.—P. J. G. P.

FITCH, L. W. N. (1943). **Osteodystrophic Diseases of Sheep, in New Zealand. I. Rickets in Hoggets: With a Note on the Aetiology and Definition of the Disease.**—*Aust. vet. J.* **19.** 2–20. **1552**

The occurrence of rickets in sheep is recorded and its probable aetiology is discussed in the light of present knowledge. The definition of rickets is discussed, and it is urged that the term be reserved for the disease entity associated with the classical lesions and not used to include a wide variety of physiological states related only by a derangement of calcium or phosphorus metabolism. The possible causes of the classical rickets lesion are reviewed: although lack of either Ca, P, or vitamin D may theoretically cause rickets it appears from the literature that it has never been produced by a simple deficiency of Ca. In the cases in sheep here recorded since dietary P was adequate, and since the condition occurred only in winter, it is tentatively suggested it was due to a deficiency of vitamin D.

—L. W. N. FITCH.

DRILL, V. A. (1943). **Interrelations between Thyroid Function and Vitamin Metabolism.**—*Physiol. Rev.* **23.** 355–379. **1553**

The interrelations between thyroid function and vitamin metabolism are critically reviewed and D. points out that, although hyperthyroidism increases the requirements for certain vitamins, this increased requirement should not imply an antithyrogenic action unless such an effect is demonstrated by further experiments. Conversely, if a vitamin antagonizes certain effects of thyroid feeding, it does not follow that a deficiency of the vitamin alone will increase thyroid activity. It is also emphasized that such factors as the length of time for which a deficient diet is fed, the influence of sex difference, and whether or not the deficiency is chronic or acute, should be carefully controlled.

The evidence indicates that a deficiency of vitamin A will produce thyroid hypertrophy although a sex difference in response is present. Experimental hyperthyroidism in mammals increases the requirements for A, but whether administration of the vitamin will prevent loss of weight in hyperthyroidism is not clear. It does seem certain, however, that in the absence of the thyroid gland carotene is not metabolized to vitamin A.

No definite conclusions can yet be made as to the effect of a vitamin B_1 deficiency on the thyroid; hyperthyroidism increases the requirements for vitamins B_1, B_6 and pantothenic acid and increases the excretion of B_1. Hepatic damage, which is partly related to the amount of B vitamins in the diet, also occurs in experimental hyperthyroidism.

Vitamin C deficiency produces haemorrhagic infiltration and hyperplasia of the thyroid of scorbutic g. pigs, the effect being more marked in chronic than in acute scurvy. In hyperthyroidism the requirements of vitamin C are increased and the amount of vitamin C in the tissues decreased.

A deficiency of vitamin D appears to have no effect on the thyroid gland, but in experimental hyperthyroidism administration of the vitamin will counteract the increased Ca excretion returning the Ca balance to normal. Although there is some indication that vitamin E deficiency in rats decreases thyroid activity, D. considers that further work is necessary to prove whether the changes reported in the gland are a result of vitamin E deficiency or are due to other dietary factors.—R. A.

HASTINGS, C. C. (1944). **Vitamin-A Deficiency in a Herd of Fat Cattle.**—*J. Amer. vet. med. Ass.* **104.** 159–160. **1554**

An outbreak of what was diagnosed clinically as vitamin A deficiency occurred in an Illinois herd of two-year-old purebred Aberdeen Angus fat cattle. H. reports the cases since they developed after a winter of feeding upon poor quality hay and the previous season's yellow maize: he contends that most Cornbelt farmers are under the impression that vitamin A deficiency will arise only when white maize, or yellow maize which has been stored for at least a year, is fed.

Deficiency symptoms, which became very marked by the beginning of March, included night-blindness, subcutaneous oedema, thick and wrinkled skin, and dry and rough coat. Prompt recovery followed the introduction into the ration of good quality lucerne hay.

—ALASTAIR N. WORDEN.

HANDLER, P., & FEATHERSTON, W. P. (1943). **The Biochemical Defect in Nicotinic Acid Deficiency II. On the Nature of the Anemia.**—*J. biol. Chem.* **151.** 395–404. [For part I, see *V. B.* **13.** 103]. **1555**

The anaemia which developed in "chronic nicotinic acid deficiency" [see part I] was not influenced by administration of iron, protein, glucose, haemoglobin, an antipernicious anaemia factor concentrate, xanthopterin or cobalt, but following the administration of nicotinic acid or nicotinamide there was a sharp reticulocyte response and subsequent elevation of the red cell count and haemoglobin concentration.

In untreated animals the anaemia was severe, it being calculated that in some instances there remained only 15% of the normal amount of circulating haemoglobin. The arrest of haemopoiesis was found to occur at the primitive erythroblast stage and this fact, together with the failure of cobalt to induce polycythaemia, is held to be compatible with the hypothesis that the anaemia was due to lack of cozymase in the earliest stages of cell development.—ALASTAIR N. WORDEN.

FRANKAU, I. M. (1943). **Acceleration of Co-Ordinated Muscular Effort by Nicotinamide. Preliminary Report to the Medical Research Council.**—*Brit. med. J.* Nov. 13th. 601–603. **1556**

The performance of fit young air-crew cadets in a modified form of the War Office agility test was improved by preliminary dosage with nicotinamide alone, or with nicotinamide plus other vitamins.

—ALASTAIR N. WORDEN.

See also absts. **1538** (bloat in cattle and sheep), **1540** (enteric problems in swine), **1561** (absorption of iron), **1594** (high protein diet for prevention of phenothiazine poisoning).

PHYSIOLOGY AND ANATOMY

CHIEFFI, A., & DE MELLO, L. H. (1939). Contribuição para o estudo da localização do centro de gravidade no corpo dos animais domesticos e dos fatores que produzem seu deslocamento temporario ou permanente. **[Location of the Centre of Gravity in Domestic Animals, with Factors Producing its Permanent or Temporary Dislocation].**—*Rev. Fac. Med. vet. S. Paulo.* **1.** 97–152. [English summary]. **1557**

The authors describe the methods used to determine the centre of gravity of the horse's body, and show how factors such as movement and attitude alter it. A detailed description is given with illustrations of the various paces of the horse, making use of slow-motion photography.—MILLER WATSON.

MAUN, M. E., & DOMEIER, L. H. (1943). **The Effects of Various Intensities of Light on Certain Laboratory Animals.**—*J. Lab. clin. Med.* **28.** 1696–1714. **1558**

The general object of the work recorded was an attempt to obtain experimental evidence for the common assumption that sunlight and artificial light are beneficial in the treatment of many diseases and that light also promotes growth. Groups of rats, rabbits, g. pigs, and chickens were exposed to different intensities of artificial light in three experimental rooms, where the lighting intensities were equivalent to 3, 100, and 1,000 foot-candles respectively. Most of the animals were placed in the experimental rooms at 4–8 weeks of age, except the cockerels which were put in at 48 hours of age. The period of exposure of each animal varied with its health, as infection often reduced the duration of the period, but healthy animals were left until they had attained young adult life. The health of the animals exposed to the different light intensities was found to be approximately the same. No differences in behaviour of the various groups could be detected, and the gain in weight was approximately the same for the animals of the several species. There was a noticeably increased rate of hair growth in animals exposed to higher intensities of light, which confirms the findings of other workers in both man and animals. The authors believe that the stimulus for increased hair growth may be central rather than peripheral. Autopsy examinations revealed no unusual differences in the organs of the various groups of animals.—N. J. SCORGIE.

DAYUS, C. V. (1942). **Water for Stock.**—*N.Z. J. Agric.* **65.** 329–331. **1559**

A popular article on the water requirements of stock, with practical recommendations.—M. B. BUDDLE.

MONTGOMERY, M. L., SHELINE, G. E., & CHAIKOFF, I. L. (1943). **The Elimination of Administered Zinc in Pancreatic Juice, Duodenal Juice, and Bile of the Dog as Measured by its Radioactive Isotope.**—*J. exp. Med.* **78.** 151–159. **1560**

Small quantities of radio-active zinc chloride (negligible when compared with the zinc already present in the body) were injected into the hind legs of dogs. The appearance of radio-active zinc in plasma, pancreatic juice, bile and duodenal juice was observed by the use of dogs with the necessary fistulae. Zinc appeared to become concentrated in the pancreas, since after two hours the level of injected zinc was much higher in the pancreatic juice than in the plasma and, over a period of 14 days, up to 11% of the injected zinc could be recovered in the pancreatic juice. There was little zinc in the bile. Fairly large quantities in the duodenal contents might not have had their origin in the duodenal secretion since in some cases the zinc appeared to be associated with a sediment composed of cellular material.—RACHEL MARSHALL.

HAHN, P. F., BALE, W. F., ROSS, J. F., BALFOUR, W. M., & WHIPPLE, G. H. (1943). **Radioactive Iron Absorption by Gastro-Intestinal Tract. Influence of Anemia, Anoxia, and Antecedent Feeding Distribution in Growing Dogs.**—*J. exp. Med.* **78.** 169–188. **1561**

The influence of various factors upon iron absorption by the dog has been studied by observing the fate of doses of radio-active iron.

Iron absorption (over a period of seven days) was not great in normal dogs nor in dogs rendered suddenly anaemic by bleeding, but the state of chronic anaemia produced within several days of the bleeding resulted in considerable absorption of radio-active iron. When the radio-active iron was given to an anaemic animal 1–6 hours after a dose of ordinary iron, the absorption was less than it would otherwise have been ; an intravenous injection of colloidal ordinary iron some days before the radio-active iron had no such effect. Further, it has been shown that large doses of iron are less well absorbed than small doses. Plasma iron rose more rapidly when iron has been fed upon an empty stomach than when it was given with food. Active absorption was observed from gastric, duodenal, and jejunal pouches, and the concentration in the plasma sometimes reached a maximum before the solution of iron was removed from the gastric pouch.

These various observations were well explained by a theory that absorption of iron is controlled by the concentration of iron in the mucosal epithelium which may become saturated with iron before equilibrium is established with the rest of the body. Examination of the tissues of growing pups which had been given radio-active iron indicated that the content of the isotope in spleen, heart, upper gastro-intestinal tract, marrow, and pancreas was greater than would have been expected from adult animals.—RACHEL MARSHALL.

QUASTEL, J. H. (1943). **Enzymes and their Mode of Action.**—*Endeavour.* **2.** 85–92. **1562**

In this review article some of the more recent work on the constitution of enzymes and their mode of action are discussed under the following headings :– "Constitution of Enzymes," "Reversibility of Enzyme Action," "Specificity of Enzyme Action," "Combination of Enzyme with Substrate," "Attachment-Groupings in the Substrate," "Receptor-Groupings in the Enzyme," "Prosthetic Groups and Coenzymes," "Cell Metabolism ".—R. ALLCROFT.

TOKAR', I. S. (1940). Izmeneniya nekotorykh pokazateleĭ krovi u krasno-nemetskovo skota v svyazi s rostom i razvitiem. **[Some Changes in Blood Morphology during Growth and Development in Red German Cattle].**—*Trud. moskov. sel'khoz. Akad.* **4.** Pt. 2. 3–17. **1563**

The erythrocyte count in newborn calves is 9·595 millions per cu. mm. and gradually falls to 5·469 millions at the age of ten years. The diameter of the erythrocytes increases with age from 4·68μ in newborn calves to 5·59μ in animals 6–9 years old. A maximal leucocyte count of 11,228 was found at the age of 3–9 months with a subsequent decrease with increase in age. Similar changes were also observed in the lymphocyte count. The number of neutrophiles increased with age and a sudden rise occurred during the first lactation. The number of eosinophiles also increased with the age of the animal, especially during sexual maturity, and diminished with the first lactation. No regular fluctuation was observed among basophiles or monocytes. The fluctuation of haemoglobin percentage was not marked ; a maximum of 13·9% was found in newborn calves and a minimum of 13% in adults.

Similar changes in blood morphology were also observed in bulls. The counts and the percentage of haemoglobin were slightly higher; the diameter of the erythrocytes was smaller than in cows.—A. MOLDAWSKY.

*KLEIN, W., & KÜHN, I. (1940). Studien über das Blutbild warmblütiger Tiere, gerichtet auf die Konstitution. IV. Das Blutbild des Schweines. [**Blood Picture of Warm-Blooded Animals. IV. Swine**].—*Z. Tierzücht. Zuchtbiol.* **46.** 203–236. [Abst. in *Biol. Abstr.* Sect. F. **16.** No. 10. 13, copied *verbatim*: Signed: H. R. BIRD]. [For part I, see *V. B.* **10.** 386. Parts II & III not traced]. **1564**

Normal swine showed the following distribution of white blood cells, in %: basophils 1, eosinophils 3, neutrophils 50, polymorphonuclear azurophils 3, "Pelger" type 2, plasma cells 0·5, large polymorphonuclears 6·5, small polymorphonuclears 27, small lymphocytes 5·5, large lymphocytes 1·5. Studies of anemia in pigs from birth to 6 weeks of age showed that % Hb and erythrocyte count both decreased during the first 10 days, after which time cell count increased while % Hb continued to fall to a minimum at 21 days, after which it increased. Hb values as low as 40% were recorded. In pregnancy there was a slight early decrease in leucocytes and later a slight decrease in erythrocytes. At parturition there was a greater decrease in Hb, erythrocytes, and leucocytes, which was, however, very transitory.

PEREVEZENTSEV, V. V. (1940). K voprosu o diagnostike funktsional'nykh serdechnykh shumov u loshadei. [**Diagnosis of the Functional Heart Murmurs in Horses**].—*Trud. Troitsk. vet. Inst.* No. 3. pp. 135–140. **1565**

P. discusses the nature of functional heart murmurs in human beings and animals. Of 22 horses affected with functional heart murmurs, 12 revealed systolic murmurs in the aorta and pulmonary artery, and six presystolic murmurs in the right, and four in the left, atrio-ventricular ostium. After ten min.'s trotting exercise, the murmurs disappeared in two horses, and in the other 20 they became more accentuated.

To differentiate between functional and organic murmurs, P. recommends the injection of atropine. In 12 cases the functional murmurs disappeared completely 20–25 min. after subcutaneous administration of atropine and in eight cases they declined considerably. Lessening and disappearance of functional murmurs were also observed in some cases after adrenalin administration.—A. MOLDAWSKY.

MEDYAKOV, F. S. (1940). Materialy k fiziologii zheludochnykh zhelez svin'i. [**Studies on Secretion of Gastric Glands in Pigs**].—*Trud. Troitsk. vet. Inst.* No. 3. pp. 259–269. **1566**

Experiments were made on two pigs with gastric fistula. Irritation of the gastric mucous membrane with a rubber tube increased the secretion of the gastric glands; adrenalin and especially morphine considerably reduced secretion. The stimulus provided by oats and bran during high continuous secretion diminished the spontaneous secretion and increased it during low continuous secretion.—A. MOLDAWSKY.

FRANK, A. H., & APPLEBY, A. (1943). **Induction of Estrus and Ovulation in Ewes during their Anestrus Season.**—*J. Anim. Sci.* **2.** 251–258. **1567**

In an attempt to explore the possibilities of developing a method for increasing lamb production, the effects of pregnant mare's serum (p.m.s.) and of diethylstilboestrol were examined in anoestrous ewes during summer. All injections of these hormones were given subcutaneously. It was found that injections of 2 mg. of stilboestrol one day and 1 mg. the next induced oestrus in 11 out of 12 ewes in from 24–96 hours after the first injection. Oestrus occurred usually in 48 hours and lasted on an average for 2–3 days. Spontaneous oestrus did not recur in 20 days. Thirteen ewes given one or more injections of p.m.s. (doses of 1, 2·5, 5, 10, and 20 ml. of p.m.s. containing 50 R.U. per ml. were used) were shown by laparotomy to have ovulated (as judged by corpus luteum formation). Oestrus occurred only twice following a single dose or daily doses of p.m.s. Four out of six ewes given two doses of p.m.s. at 16 days' interval came into oestrus following the second injection and one of these became pregnant.

While the time factor in the induction of oestrus by stilboestrol and its duration were unaffected by p.m.s., stilboestrol appeared to have an inhibitory effect on the action of the gonadotropic hormone, since, in only six out of 15 instances when they were given simultaneously, did ovulation ensue.

Stilboestrol injected in minimal quantities, or less, to produce oestrus did not enhance the action of p.m.s. sufficiently to induce oestrus timed normally with ovulation.

It appears from the experiments that stilboestrol, either alone or in combination with p.m.s., does not induce the definite hormonal stimulation of normal oestrus necessary for successful fecundation in anoestrous sheep.—J. G. MURRAY.

PHILLIPS, R. W., SIMMONS, V. L., & SCHOTT, R. G. (1943). **Observations on the Normal Estrous Cycle and Breeding Season in Goats and Possibilities of Modification of the Breeding Season with Gonadotropic Hormones.**—*Amer. J. vet. Res.* **4.** 360–367. **1568**

Observations showed that the average length of the dioestrous cycle for goats in the normal breeding season, mid-September to mid-December, was 23 days in adults and 16·6 in kids; the greatest number of cycles lasted 18–24 days, but a considerable number lasted 2–12 days.

A series of experiments is reported, involving the subcutaneous injection of gonadotropic hormones with a view to inducing oestrus in goats outside the usual breeding season. The results indicate that a single dose of 400 R.U. of pregnant mare's serum is necessary to bring dry does into oestrus, while 400–600 R.U. are needed for lactating animals. Of 15 dry and four lactating does which came into oestrus after injections of p.m.s. and were mated, six of the dry and one of the lactating does conceived. While no definite conclusions are possible on the limited data available, there is an indication that lactating does may not respond to the hormone treatment as readily as dry does. Seven of 19 does which came into oestrus after injections of p.m.s. were given injections of 1–8 R.U. of luteinizing hormone (Fevold test) on the first day of oestrus, the aim being to stimulate ovulation. Of these animals, three became pregnant, while of the 12 not so treated, four became pregnant, indicating the slight possibility that luteinizing hormone may be helpful in stimulating ovulation at the proper time.

The results indicate the possibility of stimulating the ovaries of goats by the injection of gonadotropic hormones outside the usual breeding season, thereby making it possible to provide a more uniform milk supply throughout the year. Further work, however, is needed to develop a procedure that can be used with reasonable certainty as a routine practice.—N. J. S.

*LOZINSKI, E., HOLDEN, G. W., & MACALLUM, E. N. (1942). **The Excretion of Estrogens and Gonadotropic Hormone in the Urine and Concentration of Gonadotropic Hormone in the Serum of the Pregnant Sow.**—*Rev. canad. Biol.* **1.** 677–681. **1569**

No significant quantity of oestrogenic substance is excreted by the pregnant sow. A small amount appears at the eighth week, disappears, reappears at the 14th week, and disappears again at the 16th week. It is found in significant quantities in the sow's serum during oestrus. The excretion ceases promptly from the time of conception until approximately half-way through the gestation period. The fact, however, that the ovaries of the injected test rats were slightly heavier and showed follicular growth in advance of the control animals suggests some slight gonadotropic effect at the levels at which these animals were injected. It appears that animals having large litters do not excrete oestrogenic substances in the urine during pregnancy in amounts approaching those excreted by the human being, the mare, and the cow.—R. GWATKIN.

PEARSON, O. P., & ENDERS, R. K. (1944). **Time of Ovulation and Fertilization In the Fox.**—*Amer. Fur. Breed.* **16.** No. 7. 32–34. **1570**

An investigation on 30 silver fox vixens showed that ovulation occurred on the first day or early on the second day of receptivity, but that the sperm did not penetrate the ovum until at least one day after ovulation even when mating was permitted on the first day. The usual time of fertilization was probably two or three days after ovulation. The authors point out that this long period between ovulation and fertilization is unusual among mammals, and that it may be correlated with the fact that chromosome reduction does not begin until the ovum is well on its way down the oviduct, whereas in all other mammals studied, except the dog, this process starts while the ovum is still in the ovary. The evidence presented, therefore, indicates that mating in the early part of the receptivity period may be unsuccessful because the sperm may not survive until the ovum is ready for fertilization.—N. J. SCORGIE.

HERRICK, E. H. (1944). **Some Influences of Stilbestrol, Estrone, and Testosterone Propionate on the Genital Tract of Young Female Fowls.**—*Poult. Sci.* **23.** 65–66. **1571**

Stilboestrol, oestrone, and testosterone propionate when injected intramuscularly were each found to cause enlargement of the genital tract in female chicks 18–40 days old. Eleven injections of 0·5 mg. of stilboestrol given on alternate days produced a weight increase of the genital tract, which was 48 times heavier than that of the controls. The combs of the birds treated with the three hormones were larger than those of the untreated groups. No evidence of loss of weight or of growth retardation was observed in the stilboestrol-treated birds.—N. J. SCORGIE.

SEARCY, G. L., & ANDREWS, F. N. (1943). **The Effect of Comb and Wattle Removal Upon Testicular Activity in the Domestic Fowl.**—*Poult. Sci.* **22.** 235–241. **1572**

No significant differences were observed in the semen volume, density, and total numbers of spermatozoa, and in sperm viability between the normal and dubbed Brown Leghorn and Barred Plymouth Rock males. The testes of the dubbed Brown Leghorns were significantly heavier than those of the controls. There were no observable histological differences between the testes of normal and dubbed males. Freezing of the combs and wattles in Brown Leghorns resulted in the production of inferior quality semen for the next 14–18 days.—N. J. SCORGIE.

PARKER, J. E., MCKENZIE, F. F., & KEMPSTER, H. L. (1942). **Fertility in the Male Domestic Fowl.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 347. pp. 50. **1573**

Semen was obtained for study either by means of a glass semen collector fitted to the male bird [see PARKER, 1939], or by the abdominal massage technique [see *V. B.* **11.** 334, and **14.** 31]. Samples of semen obtained from 13 cocks once a month from April to September showed the following characteristics :—volume per collection, 0·27–1·50 ml. ; density, 0·03–11·16 millions per cu. mm. ; total sperms, 12 millions to 15·62 billions ; pH, 6·65–7·78. Density, total numbers of spermatozoa per collection, and, to a lesser extent, the volume increased with the lengthening of the intervals between collections. The peak of sperm production was reached during April and May ; the minimum production occurred in September, during moulting. In a series of fertility experiments, a dosage of 0·1 ml. of undiluted semen was used ; inseminations were made within 15 min. after collection of the semen. After insemination of hens, no fertile egg was laid on the following day, the highest percentage of fertile eggs was reached on the third day, and the last fertile egg was recorded on the 25th day. The time the spermatozoa remained in the oviduct prior to fertilization apparently had no influence on the hatchability of the eggs [see also *V. B.* **14.** 31]. In experiments with mixed semen from New Hampshire, Barred Rock and White Leghorn males injected into New Hampshire females, equal numbers of chicks were sired by the Barred Rock and New Hampshire males, but considerably fewer chicks by the White Leghorn males. This apparent incompatibility of sperm from Leghorn males and ova from New Hampshire hens requires further investigation.

This bulletin gives a description of the genitalia of the male fowl, and contains an extensive review of the relevant literature on the physiology of reproduction in domestic poultry.—N. J. SCORGIE.

ELY, R. E., HERMAN, H. A., & WINCHESTER, C. F. (1942). **Studies of Respiration Rate of Dairy Bull Spermatozoa.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 353. pp. 24. **1574**

Values for O_2 consumption of sperm collected from ten bulls were determined by means of a modified Barcroft-Warburg respirometer. Wide variations occurred in the values obtained from different ejaculates of the same bull, and were similar to variations found in other characteristics. Average values for O_2 consumption were found to increase with increases in survival time of the sperm. Sperm of high initial motility had a higher average initial O_2 consumption, and on the average maintained a higher motility rate in storage. These relations between sperm survival and initial O_2 consumption are taken to be further evidence of the importance of the intracellular reserves influencing sperm metabolism and longevity. Samples of semen containing large numbers of abnormal spermatozoa were characterized by low O_2 consumption. A marked increase in O_2 consumption of sperm was found in a seminal fluid medium over control samples in phosphate buffer ; the mechanism of this increase is as yet unexplained, but the finding emphasizes the importance of the composition of the medium in comparative respiration studies. Centrifuging caused a depression of O_2 consumption in bull sperm which was apparently due to a decrease in the number of living spermatozoa.

—N. J. SCORGIE.

WALTON, A. (1942). **Notes on Artificial Insemination of Sheep, Cattle & Horses.** pp. 24. London : Holborn Surgical Instrument Co. [8vo] [1s.] [3rd Edit.] **1575**

This booklet is intended as a guide to the care and use of the instruments required for artificial insemination ; the technique of semen collection, handling of

semen, and insemination of the female is described for sheep, cattle, and horses. A short section, not included in the previous editions, deals with the diagnosis of infertility in the male and the evaluation of semen. The booklet includes diagrams of the apparatus required for artificial insemination, together with a current price list.—N. J. SCORGIE.

PINTO E SILVA, P., & CHIEFFI, A. (1939). Demarcação das regiões da cabeça no cavalo. [**Anatomical Regions of the Head of the Horse**].—*Rev. Fac. Med. vet. S. Paulo.* **1.** 79–96. **1576**

The authors give an anatomical description of the parts included in the "points" of the horse's head.
—MILLER WATSON.

PINTO E SILVA, P. (1939). Abertura do "ductus parotidicus" no bovino (mestiço de zebú). [**Opening of the Parotid Duct in Zebu Crosses**].—*Rev. Fac. Med. vet. S. Paulo.* **1.** 171–176. [English summary]. **1577**

The author studied the opening of the parotid duct in 200 zebu-cross cattle. In 66·5% the opening was opposite the fifth upper molar and in 33·5% between the fourth and fifth. In all specimens the duct opened on a papillus and the orifice was single. In 66·03% the orifice was in the form of a small slit; in the remainder it was a mere point.—MILLER WATSON.

ELIZONDO, M. J. (1939). Irrigación de la laringe y cuerpo tiroides en anatomía veterinaria. [**Blood Supply of the Larynx and Thyroid Gland in Domestic Animals**].—*An. Fac. Med. vet., Univ. La Plata.* **2.** 177–197. **1578**

This is an account of the blood supply of the larynx and thyroid gland in domestic animals. E. studied the subject from carefully injected specimens. Illustrations are given.—MILLER WATSON.

See also absts. **1553** (thyroid function and vitamin metabolism), **1621** (glossary of terms used in sex hormone therapy).

POISONS AND POISONING

MOXON, A. L., & RHIAN, M. (1943). **Selenium Poisoning.**—*Physiol. Rev.* **23.** 305–337. **1579**

In this review the selenium poisoning problem is discussed under the following headings:—"Geological Distribution of Selenium", "Selenium in Soils", "Absorption of Selenium by Plants", "The Use of Selenium for the Control of Insects on Plants", "Selenium Poisoning in Livestock", "Selenium Poisoning in Poultry", "Experimental Selenium Intoxication in Laboratory Animals", "Organic Selenium Compounds", "Public Health", and "Methods of Analysis for Selenium".

Much of the information reviewed is already in the *Vet. Bull.* [see **5.** 854; **6.** 81 & 616; **10.** 58, 296, & 710; **12.** 354, and other references to selenium].

Some of the more recent work discussed includes the effect of a high protein diet in alleviating symptoms of Se poisoning, but it is pointed out that the species differences in the response to this effect indicates the need for experimental work with farm animals before any practical application can be recommended. Also from consideration of the evidence on the specific effect of Se on the enzyme systems, it is evident that much more information is necessary before the exact mechanism of Se poisoning can be elucidated.—R. ALLCROFT.

SKINNER, R. W. (1942). **Salt Poisoning in Cows.**—*N.Z. J. Agric.* **64.** 46. **1580**

After having access to a mixture containing three parts of coarse agricultural salt and one part of powdered mineral lick, two out of 30 dairy cows died. P.M. examination showed marked inflammation of the lining of the fourth stomach which was covered with a coating of powdered lick and some salt. It was concluded that death was due to salt poisoning and it is pointed out that salt had not been available on the farm for some time previous to the incident.—R. ALLCROFT.

JENSEN. (1943). Arsenvergiftung von Pferden eines Grenadier-Regiments. [**Arsenic Poisoning of Horses of a Grenadier Regiment**].—*Z. Veterinärk.* **55.** 112. **1581**

Some of 440 horses stabled for the night in a collective dairy farm died suddenly in a few hours. Before death they were restless and nervous, and showed strained breathing and serous secretions from the eyes and nose. They vomited and had diarrhoea, passing frothy, slimy, evil smelling faeces, and died in apoplectiform convulsions. On P.M. examination, changes were seen only in the alimentary tract which was congested. The small intestine contained bile and smelled of H_2S. The stomach contents of the dead horses contained arsenic. The horses had been watered by pail from a distant spring, ponds, and a nearby dip used for control of ticks on cows. Water from the dip contained arsenic.—E. BOYLAND.

CUNNINGHAM, I. J., HOPKIRK, C. S. M., & FILMER, J. F. (1942). **Photosensitivity Diseases in New Zealand. I. Facial Eczema: Its Clinical, Pathological, and Biochemical Characterization.**—*N.Z. J. Sci. Tech.* **24.** 185A–198A. **1582**

The disease popularly called "facial eczema" which usually affects sheep and less frequently cattle, and which under certain seasonal conditions may reach epizootic proportions in certain areas of New Zealand, is described.

The characteristic clinical symptoms are photosensitivity and icterus, which may be accompanied by a general disturbance in health with considerable mortality. The P.M. appearance and the histopathology of the liver and skin lesions are described in some detail.

A positive biphasic van den Bergh test is usually obtained in the early stages of the disease; the bilirubin concentration varies from 0·4 mg. to over 10 mg. per 100 ml. plasma in some cases, the usual range being from 1–5 mg. %. In a large proportion of cases, phylloerythrin and coproporphyrin are found in the blood from the earliest appearance of photosensitization.

The authors conclude that in facial eczema a primary intoxication of the liver occurs and that as a consequence the excretion of bile with its contained phylloerythrin is diminished. Phylloerythrin accumulates in the systemic circulation leading to the development of photosensitisation. The agent causing liver damage has not yet been identified, but the toxic factor appears to be present in the pasture at certain stages of growth in certain seasons.

Brief descriptions of other photosensitivity diseases encountered in New Zealand, presenting a clinical picture superficially similar to that of facial eczema, are given. Photosensitivity diseases reported from other countries are briefly discussed.—M. B. BUDDLE.

LEVY, E. B., & SMALLFIELD, P. W. (1942). **Photosensitivity Diseases in New Zealand. II. Facial Eczema: The Influence of Soil, Climate, Pasture Composition, and Management.**—*N.Z. J. Sci. Tech.* **24.** 198A–214A. [See also preceding abst.] **1583**

An investigation of the influence of soil, climate, pasture composition, and management on the con-

ditions that predispose towards facial eczema epidemics showed that the disease occurs under very diverse conditions, but it does appear that in certain seasons and localities when air and soil temperatures are above normal, a rapid autumn growth of pasture may be followed by a widespread outbreak of the disorder in sheep and cattle. The most severe outbreaks occur on pastures where perennial rye-grass is dominant and where the pastures have flushed rapidly due to rain, after being closely eaten and dried out during a hot dry spell.

It is, however, pointed out that the exact conditions giving rise to the disease cannot yet be defined, as cases occur in certain localities and even in certain fields in non-epidemic seasons in pastures containing very little rye-grass, in pastures in a rank stage of growth, in dry weather on closely eaten pastures, and in pastures which have remained green the whole season. It is suggested that, until the causative agent has been identified, epidemics might be controlled by suitable grazing management over the dangerous period.—R. ALLCROFT.

ROCHA E SILVA, M. (1940). Importância da fotosensibilização para a medicina humana e veterinária. **[Photosensitization in Man and Animals].**—*Rev. Fac. Med. vet. S. Paulo.* **1.** 225–246. [English summary]. **1584**

The author reviews present knowledge of photosensitization by fluorescent dyes and the ingestion of certain plants. He refers to hypericism, fagopyrism, and geeldikkop.

He describes in detail a disease of cattle in Brazil caused by ingestion of a cyanogenetic plant, *Holocalyx glaziovii*, which produces photosensitization. He refers also to phenomena of photosensitization produced by the consumption of cyanogenetic plants and suggests that this is caused by the action of HCN in augmenting the photodynamic character of a naturally occurring porphyrin (phylloerythrin) in the tissues of herbivorous animals.—MILLER WATSON.

MCINTOSH, R. A. (1943). **Light Sensitization.**—*Canad. J. comp. Med.* **7.** 213–215. **1585**

This is a report of photosensitization in a purebred roan shorthorn heifer, the only affected animal in the herd. The entire epidermis peeled off. The animal recovered and had a normal coat in two months. Clover was regarded as the sensitizing agent.—P. J. G. P.

MORA G, R. (1943). Contribución al estudio de las plantas tóxicas en medicina veterinaria. **[Contribution to the Study of Plants Poisonous to Stock].**—*Rev. Med. vet., Bogotá.* **12.** No. 83. 5–38. **1586**

M. studied the toxic action of *Tanaecium exitiosum*, a plant which causes considerable losses among cattle, sheep, and goats in Columbia. The symptoms of intoxication consist of difficulty in movement, salivation, conjunctivitis, wild appearance, and weak and very fast pulse with abnormal heart sounds. Some animals show extreme excitement ending in collapse with loss of consciousness. On P.M. examination there is found intense haemorrhagic gastritis, petechiae of the pericardium and cardiac muscle, hepatitis, and nephritis. Symptoms become acute only when the animal moves and apparently the toxic principle affects the circulatory system to such an extent that movement intensifies its action. The dried plant has no toxic action. No specific treatment is given.

M. also studied *Jussiaea peruviana*, another plant which causes deaths in cattle. Symptoms only appear after the animals have been eating the plant for 2½–3 months, and consist of difficult micturition, arching of the back, diarrhoea, inco-ordination of movement, oedema, and inappetence. The principal lesion is acute nephritis. The toxic principle of the plant appears to be a substance related to choline and similar to muscarine. Treatment, which is only possible in the early stages, consists in the elimination of the toxin by purges etc. and keeping the animal as quiet as possible.—M. W.

I. VELÁSQUEZ Q, J. (1943). Intoxicación con reventadera. **[Poisoning of Bullocks by** *Reventadera* (" *Pernettya prostrata* **var.** *pentlandii* ")].—*Rev. Med. vet., Bogotá.* **12.** No. 83. 39. **1587**

II. MEZEY, K. (1943). Pernettya prostrata: Var. pentlandii. (Reventadera o mortiño venenoso). Toxicologiá, farmacodinamia y tratamiento de la intoxicación. **[Poisoning by** " *Pernettya prostrata* **var.** *pentlandii* " (*Reventadera*). **Toxicology, Pharmacology and Treatment].**—*Ibid.* 40–58. **1588**

I. The author reports poisoning of two cows by " *P. prostrata* var. *pentlandii* ", a plant of the Ericaceae family. One cow was dying when the author first saw the animals. The other was lying on its side, incapable of rising, semi-comatose with temperature slightly subnormal and a weak, soft pulse. Breathing was slow and the lumbar reflex was absent. There were slight clonic contractions of the femoral group of muscles. The animal improved slightly after the administration of stimulants but died later. At autopsy considerable haemorrhages were found in the heart muscle and the lining of the rumen was petechiated. The gall bladder contained a thick, chocolate-coloured secretion.

II. M. carried out a careful study of the pharmacology of " *P. prostrata* ". He found the plant to be highly toxic, 10 g. of the plant per kg. body weight of the animal proving fatal when taken *per os*. The toxic action of the plant results in marked stimulation of the vagus which can be completely counteracted by the use of adequate doses of atropine. Treatment of cases of poisoning consists in the elimination of the plant by gastric and intestinal lavage and by the administration of purges. Atropine in full doses counteracts the action of the poison.—MILLER WATSON.

BRASH, A. G. (1943). **Lupin Poisoning of Sheep.**—*N.Z. J. Agric.* **67.** 83–84. **1589**

A description is given of three outbreaks of poisoning in sheep after being put on paddocks containing old lupins which consisted mainly of stalks and pods, mixed with either turnips or rye and red clover. Sheep which had previously been on the paddocks when the lupins were young and leafy showed no evidence of sickness. Symptoms included inappetence, stupor, reluctance to move in some cases and wandering to the fences in others. General icterus was the most characteristic finding in all cases examined, although in some there was considerable swelling about the head, and the skin came off the ears and nose and also along the top of the head. P.M. examination showed that the organs appeared normal except for the icterus. Altogether 79 out of about 1,400 sheep died and it is concluded that ingestion of the seed pods was the cause of death.
—R. ALLCROFT.

I. ROBINSON, W. D. (1942). **Mangel Poisoning in Pigs.**—*N.Z. J. Agric.* **65.** 199–202. **1590**

II. MCINTOSH, I. G., NIELSON, R. L., & ROBINSON, W. D. (1943). **Mangel Poisoning in Pigs.**—*Ibid.* **66.** 341–343. **1591**

I. The death of 200 out of 600 pigs of all ages occurred ½–2 hours after feeding freshly pulled cooked mangels. Muscular weakness, followed by laboured respiration was observed, death resulting from asphyxiation generally preceded by convulsions. Analysis of the cooked mangel mixture showed that nitrite was present in considerable amounts and it is suggested that the nitrate present in the raw mangels was con-

verted to nitrite either during the cooking process or during the period the food was standing before feeding. Because of the danger of poisoning it is advised that freshly pulled mangels, either raw or cooked should not be fed to stock but should be kept in a clamp for at least six weeks to allow them to mature.

II. Two further deaths occurred in pigs on the same farm as those reported in I, when cooked mangels were fed after having been clamped for seven weeks. Investigations showed that mangels cooked at temperatures below boiling point, or for too short a time at boiling point, were dangerous to pigs owing to the amount of nitrite formed during cooling. The production of toxic nitrite on cooling may be avoided by cooking mangels for at least two hours at or near boiling point. Mangels, even if clamped for a considerable period, may produce dangerous feed if inadequately cooked.—M. B. Buddle.

Kehar, N. D. (1943). **Some Plants Poisonous to Livestock.**—*Indian Fmg.* **4.** 130–131. **1592**

The paper deals with general factors incidental to poisoning by plants, and with the forms of losses accruing from them. Chief attention is devoted to HCN-producing plants, symptoms of HCN poisoning, preventive and curative treatment, and simple tests for detecting cases in the field.—P. G. Pande.

McGrath, R. E., & Campbell, D. (1944). **Poisoning of Cattle Through the Use of Nicotine and Lime Dressing for Warbles.**—*Vet. Rec.* **56.** 64–65. **1593**

Shortly after 24 cattle had been dressed with lime-nicotine solution made up in accordance with the formula prescribed by the Ministry of Agriculture, they all showed signs of illness, and within 1¼ hours three had died. Since these three represented 75% of those visibly affected with warbles, the authors conclude that poisoning is facilitated by the presence of warble holes in the skin, as they consider the intake of nicotine by mouth due to licking to have been negligible. The only constant P.M. lesion was a pronounced anaemic appearance. Treatment of survivors consisted of dosing with tannic acid in treacle water supplemented in some cases by subcutaneous injections of camphor and ether in oil.—G. B. S. Heath.

Woolf, F. P., & Simms, B. T. (1943). **Studies of the Toxicology of Phenothiazine in Horses and Mules.**—*N. Amer. Vet.* **24.** 595–599. **1594**

This is a preliminary report on the effect of diet on the toxicity of phenothiazine in horses and mules. Two diets were employed, the first consisting of unground white maize and no. 3 (poor grade) Johnson grass and the second, a high protein diet, consisting of whole oats and no. 2 leafy alfalfa hay. Five horses and five mules were used in the experiment and were fed on the test diet for at least 28 days prior to the administration of phenothiazine and for at least 30 days following treatment. Two different samples of phenothiazine were tested, the dosage rate being 5 g. per 100 lb. body weight in all cases except two in which the dosage rate was 6 g. per 100 lb. body weight. The drug was administered in gelatin capsules without starvation, except in the case of one horse to which the drug was administered mixed with the food after previous starvation. The diet itself had no observable effect on the condition of the animals.

Of the four horses on the first diet, all developed an anaemia after treatment with phenothiazine (three received a single dose and the fourth was given two doses). The anaemia reached its peak from the 12th to 30th day after medication and as recovery set in it changed from a monocytic to a macrocytic type. Icterus was also present, its severity paralleling that of the anaemia. No change from the normal was noted in any of the four horses on the second diet after administration of phenothiazine (three received single doses and the fourth was given three doses). Four mules were given phenothiazine whilst they were receiving each of the test diets in turn, and no untoward symptoms were observed in any case. In ten cases the animals treated had already received phenothiazine, the shortest interval between treatments being 25 days and the longest 116 days. There was no evidence that the treatment previously given influenced the response of the animals to the drug. The authors conclude tentatively that horses are protected against the haemolytic effect of phenothiazine by a high protein diet.—T. E. Gibson.

See also abst. **1535** (staggers in animals).

PHARMACOLOGY, THERAPEUTICS AND DISINFECTION

Mezey, K. (1943). Toxicología y farmacodinamia en la medicina veterinaria. **[Toxicology and Pharmacology in Veterinary Medicine].**—*Rev. Med. vet., Bogotá.* **12.** No. 83. 59–67. **1595**

This is a general article on the value of the study of toxicology and pharmacology in veterinary medicine. A brief résumé of biological methods of study is given. —Miller Watson.

Keiding, E. (1943). Grundrids af Sulfonamidernes Kemi og Farmakologi. **[The Chemistry and Pharmacology of the Sulphonamides].**—*Maanedsskr. Dyrlaeger.* **55.** 321–351. **1596**

A general lecture for veterinarians on the history of sulphonamides and their mode of action. Seventeen of the best known compounds are included in a table showing chemical name, trade names in use in Denmark, composition and formula, bacteria against which they are active, and names of their discoverers and first clinical users.

The diverse behaviour of sulphanilamide in the common domestic animals is described. Absorption after peroral administration is much faster in horses than in cattle and faster still in dogs. Dogs excrete 5–10% through the skin and horses and cattle excrete 30–35% in the faeces, the remainder in all three animals passing through the kidneys. Emphasis is laid on the necessity to give an adequate initial dose of sulphonamides and to check this blood concentration.—J. E.

Roberts, S. J. (1943). **The Effects of Various Intravenous Injections on the Horse.**—*Amer. J. vet. Res.* **4.** 226–239. **1597**

The effect of intravenous injection of various substances into 69 horses, most of which were old or suffering from chronic ailments, was studied. Prior to experiments upon substances of possible pharmacological significance, the effect of injection of (1) air or oxygen, (2) physiological saline, (3) hypotonic solutions, (4) hypertonic saline was observed. Small amounts of (1) were harmless in the venous circulation, but caused some severe reactions when injected into the arterial circulation. Little effect was caused by (2) even when extremes of rates of injection, temperature, and quantity were employed. Large quantities of (3) were tolerated, but more than 4,000 ml. of water caused haemolysis and haemoglobinuria. (4) caused increased peristalsis and decline in coagulation time of blood. Decline in coagulation time was shown after injection of the following substances :– Lang's solution (sodium chloride and sodium citrate), gelatin, formalin, chloral hydrate, sodium iodide, calcium gluconate, magnesium sulphate,

sodium citrate, oxalic acid, in decreasing order of potency.—RACHEL MARSHALL.

HANZLIK, P. J., & CUTTING, W. C. (1943). **Sulfonamide Depression of Inorganic Catalytic Action.**—*Science.* **98.** 389–391. **1598**

The theory that the antibacterial action of sulphonamides may be due to a general anticatalytic property, which would manifest itself as well in inorganic as in living systems, has been tested.

The inorganic reaction chosen for study was the liberation of oxygen from hydrogen peroxide in the presence of fuller's earth, platinum black, or colloidal silver as catalysts. A number of protoplasmic poisons and antiseptics, among which were quinine derivatives, sodium salicylate, acriflavine and sodium cyanide were shown to be inhibitors of this reaction and it was furthermore found that the sulphonamides also exerted an inhibitory effect upon the catalysts, though their action was in general weaker than that of the other substances. *P*-aminobenzoic acid and nicotinic acid, though inhibitory towards the antibacterial action of the sulphonamides, did not have an inhibiting effect upon these inorganic catalysts.—RACHEL MARSHALL.

MESSER, I. A. (1944). **The Bactericidal Effect of Certain Plastic Materials.**—*Mon. Bull. emerg. publ. Hlth Lab. Serv., Lond.* **3.** 18–19. **1599**

Extracts of certain plastic stoppers from bottles used to hold media, inhibit the growth of *Bacterium coli.* The inhibitory substance appears to be formaldehyde, which was shown to be liberated when the plastic material was heated in boiling water.—E. BOYLAND.

KEENEY, E. L. (1943). **The Fungistatic and Fungicidal Effect of Sodium Propionate on Common Pathogens.**—*Johns Hopk. Hosp. Bull.* **73.** 379–390. **1600**

The fungistatic action of sodium propionate for various strains of common pathogenic fungi was tested *in vitro.* Positive effects with concentrations of the drug varying from 0·0125–1·25% were obtained, provided that the pH was adjusted to 5·5 and the drug was in contact with the growing organisms for long periods. *Actinomyces bovis* was completely inhibited in a 2% solution of the drug. With short exposures higher concentrations were needed. There is evidence that sodium propionate has a low toxicity and that its prolonged application does not induce irritation.

—J. M. ROBSON.

WILKINS, W. H., & HARRIS, G. C. M. (1943). **Investigation into the Production of Bacteriostatic Substances by Fungi. II. A Method for Estimating the Potency and Specificity of the Substances Produced.**—*Ann. appl. Biol.* **30.** 226–229. [For part I, see *V. B.* **13.** 403. See also *V. B.* **14.** 210]. **1601**

A "zonation" method is described for estimating qualitatively and quantitatively the potency and specificity of bacteriostatic substances. A few drops of the substance to be tested are placed in a hole (made with a cork borer) in the centre of a plate of agar in which the test organism is incorporated, with the consequent production of a zone of inhibition which varies in width in proportion to the potency of the bacteriostatic substance. Comparison of this simple "zonation" method with the standard "dilution" method showed a close correlation of the two methods.—R. ALLCROFT.

FOSTER, J. W., & WOODRUFF, H. B. (1943). **Microbiological Aspects of Streptothricin II. Antibiotic Activity of Streptothricin.**—*Arch. Biochem.* **3.** 241–255. [For part I, see *V. B.* **14.** 172]. **1602**

Streptothricin is relatively more effective against Gram-negative bacteria and certain yeasts and fungi than is penicillin. It is particularly active in inhibiting the growth of organisms of the salmonella group and *Bacterium coli.* The curves relating inhibition and concentration of streptothricin and penicillin have different shapes, but the inhibitory action of the two substances on an organism can be summated. If *Bact. coli* is grown in the presence of streptothricin it develops resistance to the agent, probably owing to the selection of resistant cells. Streptothricin has a bactericidal action which is apparently independent of the concentration of organisms. The action varies with pH, being greatest in alkaline solution (pH 8·0). The reduced activity in acid media is probably not due to chemical destruction but rather to salt formation, as the addition of weakly ionizing salts such as phosphates also reduces the activity. Cells of *Bacillus subtilis* which have undergone partial inhibition by streptothricin become abnormally long and remain in long chains.—E. B.

FLOREY, H. W. (1944). **Penicillin: Its Development for Medical Uses.**—*Nature, Lond.* **153.** 40–42. **1603**

The discovery of penicillin by Fleming in 1929 is described. The crucial observation, that when an ethereal solution of crude penicillin is shaken up with water containing the right amount of alkali, the penicillin passes back into the water, opened up the way to its purification. Penicillin salts are stable at about neutrality, but are destroyed by acid and alkali, oxidizing agents, certain metals and alcohols, and enzymes produced by certain air bacteria. Among the bacteria highly susceptible to penicillin are *Streptococcus pyogenes, Streptococcus pneumoniae, Staphylococcus aureus, Corynebacterium diphtheriae, Clostridium welchii, septicum* and *oedematiens, Neisseria gonorrhoeae,* and *Neisseria meningiditis.* Penicillin does not kill the organisms, but stops their growth, and they are then killed by the natural defences of the body. The pharmacological properties of penicillin are described. It has a very low toxicity and its activity is not affected by pus. It is destroyed when given orally and must therefore be injected. It is very rapidly excreted in the urine and hence large and frequent doses have to be given, unless it is applied locally.—J. M. ROBSON.

—. (1944). **Discussion on Penicillin.** [Speakers: FLEMING, A., FLOREY, H. W., BODENHAM, D. C., CUTLER, E. C., HUDSON, R. V., CHRISTIE, R. V., JEFFREY, J. S., FLOREY, M. E., & ROBINSON, J. N.] —*Proc. R. Soc. Med.* **37.** 101–112. **1604**

The discovery of penicillin was described and also the plate method of testing whether an organism is sensitive to it. The action of the drug is essentially bacteriostatic and phagocytosis plays an important part in killing the bacteria. On intravenous or intramuscular injection penicillin is rapidly eliminated, large quantities passing into the urine.

The organisms most sensitive to penicillin are the gonococcus, the meningococcus, the pneumococcus, staphylococci, streptococci, anthrax bacilli, and clostridia. Others such as typhoid bacillus are less sensitive, but may be within the therapeutic range of the more highly purified preparations. The coliform group, *Proteus, Pseudomonas pyocyanea,* and the tubercle bacillus are insensitive. The drug is most stable between pH 5 and 7. It is destroyed by acids and alkalis, heavy metals, oxidizing agents and enzymes from many common bacteria. It is very soluble, easily absorbed and non-toxic in very large doses. It can be applied locally in solution, as a powder combined with sulphanilamide (95%) and light magnesium oxide (5%), or as a cream with a lanette wax vaseline base. The results following its general and local use in various types of wounds are described by a number of investigators. Soft wounds appear to do particularly well, but further

work is necessary in the treatment of wounds involving bones. A complication of penicillin treatment is the development of Gram-negative pus which collects in any dead spaces in the wound ; this delays healing only slightly. The drug is highly effective in the treatment of gonorrhoea due to sulphonamide-resistant organisms. —J. M. ROBSON.

FISHER, A. M. (1943). **The Antibacterial Properties of Crude Penicillin.**—*Johns Hopk. Hosp. Bull.* **73.** 343–378. **1605**

Methods are described for the production, testing, and preservation of crude penicillin (*i.e.* filtered culture fluid without further purification) and data are given on the effect of pH and of temperature on the stability of the drug. It is not toxic to animals by local or parenteral administration. Most of the Gram-positive cocci tested were sensitive to penicillin, but about 13% of the staphylococci resisted its action. The action of penicillin is apparently bactericidal in the stronger solutions and bacteriostatic in the weaker ones. Limited chemical trials in local infections have produced some encouraging results : thorough and prolonged application may present a difficulty. The data suggest that the easily and comparatively quickly prepared crude material might prove of value in veterinary practice. This should, in F.'s opinion, be investigated.—J. M. R.

ROBINSON, G. H., & WALLACE, J. E. (1943). **An Inoculated Penicillin Dressing.**—*Science.* **98.** 329–330. **1606**

Dressings composed of layers of gauze, impregnated with a suitable medium and inoculated with *Penicillium*, have been shown to produce appreciable amounts of penicillin when placed over sterile human plasma. It is suggested that such dressings may be of value in the treatment of septic conditions and a few preliminary, and apparently favourable, clinical results are given. —J. M. ROBSON.

HARPER, G. J. (1943). **Inhibition of Penicillin in Routine Culture Media.**—*Lancet.* **245.** 569–571. **1607**

Certain species of saprophytic bacteria are able to destroy penicillin. The destructive action can be demonstrated in crushed organisms and it is probably due to an enzyme, which has been called penicillinase. Bacteria with penicillinase were detected among organisms which would grow in the presence of 1 : 5,000 of penicillin, by their ability to neutralize the growth-inhibiting action of penicillin on *Staphylococcus aureus*. Penicillinase was present in two strains of *Bacterium coli*, in *Bact. aerogenes* and in an air-borne micrococcus, but was most abundant in strains of the paracolon bacillus. The action can be shown with living cultures, culture filtrates, and dried preparations. The enzyme content does not appear to be increased by growing the paracolon bacillus in the presence of penicillin. It is suggested that the incorporation of dried penicillinase powder in media would be advantageous in carrying out blood culture tests on patients with circulating penicillin and in carrying out sterility tests on penicillin preparations intended for clinical use.—E. BOYLAND.

NOGUEIRA, F. R. (1942). A propos des bactériémies expérimentales par le *Streptococcus viridans*. Action des injections d'adrénaline. [**Influence of Adrenalin on** *Str. viridans* **Bacteraemia**].—*Arq. Inst. bact. Cam. Pest.* **8.** 145–162. [In French : English and German summaries]. **1608**

In a study of the depressant action of adrenalin hydrochloride on the reticulo-endothelial system, N. injected cultures of *Str. viridans* into rabbits previously injected with the drug. The resulting bacteraemia was more prolonged than in the control animals. In both injected and control animals, bacteria disappeared from the blood during the first few hours after injection, but reappeared once or several times, at intervals of hours or days. In no case did any lesion of general or focal infection develop.—ISOBEL W. BURTON.

RAIZISS, G. W., SEVERAC, M., & MOETSCH, J. C. (1943). **Effects of Sulfapyrazine and Sulfadiazine on Mice Infected with Hemolytic Streptococcus, Pneumococcus, and Staphylococcus Aureus.**—*J. Lab. clin. Med.* **28.** 1580–1585. **1609**

Diets containing 0·25% and 0·5% sulphapyrazine and 0·25% and 0·5% sulphadiazine were tolerated by mice for 14 days. Higher concentrations of the drugs in the diets caused deaths in a few days. The tolerated diets gave respective blood concentrations of 7·2 and 10·4 mg. per 100 ml. of sulphapyrazine and 15 and 26 mg. per 100 ml. of sulphadiazine. The survival of mice infected with different bacteria and fed with food containing the drugs was determined. The compounds were equally effective in preventing deaths from infection with *Streptococcus haemolyticus* or with *Staphylococcus aureus*. Against pneumococcal infection (of types I, II, or III) sulphapyrazine appeared to be slightly more effective than sulphadiazine.—E. BOYLAND.

HAC, L. R., & EILERT, M. L. (1943). **Experimental** *Clostridium welchii* **Infection. I. Oral Sulfonamide Therapy. (Sulfanilamide, Sulfapyridine, Sulfathiazole and Sulfadiazine).**—*J. infect. Dis.* **73.** 167–172. **1610**

The infections were produced by intramuscular inoculation of mice. The drugs were administered in the diet and fed for four days before, and seven days after, inoculation. In animals in which high drug concentrations (> 15 mg. %) were maintained in the blood, sulphadiazine gave a survival rate of 93·8%, sulphathiazole 83%, sulphapyridine 46·5% and sulphanilamide 27·2%, as compared with 12·6% in the untreated controls. In an experiment to compare the value of chemotherapy and antitoxin, 20 units of antitoxin were given to 20 mice after inoculation with *Cl. welchii* ; all these animals survived. Most of the treated animals and some of the controls that survived two weeks after inoculation had large necrotic lesions at the site of inoculation from which *Cl. welchii* could be isolated in pure culture.—J. M. ROBSON.

MCINTOSH, J., & SELBIE, F. R. (1943). **Combined Action of Antitoxin and Local Chemotherapy on** *Cl. welchii* **Infection in Mice.**—*Lancet.* **245.** 224–225. **1611**

Clostridium welchii Type A infection in mice was treated with antitoxin alone, with proflavin or penicillin applied locally, and with a combination of these treatments. It was hoped that the combined treatment would be of value in the later stages of the disease when the organisms have invaded the bloodstream. Antitoxin combined with local chemotherapy gave better results than did antitoxin or chemotherapy alone. Because of the rapid progress of the infection, any treatment must be given in adequate measure as soon as possible.—J. K.

MACFARLANE, M. G. (1943). **The Therapeutic Value of Gas-Gangrene Antitoxin.**—*Brit. med. J.* Nov. 20th. 636–640. **1612**

A careful analysis of the records of certain human casualties was made to determine whether antitoxin was of any value in the treatment of gas gangrene. The cases studied had all shown marked toxaemia. The value of antitoxin was established by the significant lowering of the fatality rate when antitoxin therapy was used together with surgery. The combined treatment was much more effective than either of the measures singly.

The beneficial effect of antitoxin was much more

pronounced when the initial dose was given soon after diagnosis, and an adequate dose is essential.—J. K.

—. (1943). **Discussion on Modern Drugs in the Prevention and Treatment of Tropical Diseases.** [Speakers: JAMES, S. P., HAWKING, F., HANSCHELL, H. M., HOWIE, J. W., NICOL, W. D., SHUTE, P. G., BIGGAM, A. G., & ADAMS, A. R. D.]—*Trans. R. Soc. trop. Med. Hyg.* **37.** 71–88. **1613**

The discussions recorded covered the drug treatment of malaria and the value of diamidine compounds and sulphonamides in tropical diseases.

In malarial treatment, it was pointed out that the exo-erythrocytic phases of the parasites are resistant to known drugs, and that they are probably responsible for the failure of drugs in prophylaxis and in the prevention of relapses. The value of a large initial dose of the drug selected is emphasized on the grounds that massive destruction of the parasites stimulates antibody production. It was claimed that atebrin has a value as a prophylactic and suppressive, and it was suggested that it might attack the sporozoites before they had initiated the exo-erythrocytic phase.

Of the diamidine compounds, stilbamidine and propamidine have a value in the treatment of sleeping sickness, but are thought to be inferior to tryparsamide and Bayer 205 (germanin). It is claimed that they are valuable in the treatment of leishmaniasis, and propamidine powder insufflated into the vagina was said to have given good results in the treatment of human infections with *Trichomonas vaginalis*.

Sulphonamides have proved beneficial in the treatment of plague, and, to a lesser degree, of filarial lymphangitis, lymphogranuloma inguinale, trachoma, tropical ulcer, and tropical pyomyositis, but have little value in brucellosis and protozoan or rickettsial infections.

The importance was emphasized of estimating the blood concentrations of drugs, and the value was mentioned of the Tanret reactions for quinine in the urine in malaria. Some human beings taking quinine excrete little or none of the drug in the urine, and some of these have a history of repeated attacks of malaria. —U. F. RICHARDSON.

LOURIE, E. M., & COLLIER, H. O. J. (1943). **Unimpaired Susceptibility of *Trypanosoma rhodesiense* to Arsenicals after Intensive Treatment by Mepacrine.** —*Ann. trop. Med. Parasit.* **37.** 205–210. **1614**

It is known that treatment of trypanosome infections by non-arsenical dyes of the acridine and related groups produces parasites resistant to arsenicals. Mepacrine, a drug related to the acridines and used in the treatment of malaria, was, therefore, tested for its power to produce resistance to arsenicals in *T. rhodesiense* infections in mice. Intensive treatment of infected mice, and exposure of trypanosomes to the drug *in vitro* failed to increase the resistance of the strain of *T. rhodesiense* used, either to the drug itself or to arsenicals. Mepacrine is not trypanocidal *in vivo*, although it has a trypanocidal action *in vitro*.—U. F. R.

HEWITT, R. I., & RICHARDSON, A. P. (1943). **The Direct Plasmodicidal Effect of Quinine, Atabrine and Plasmochin on *Plasmodium Lophurae*.**—*J. infect. Dis.* **73.** 1–11. **1615**

Great difference of opinion exists regarding the mode of action of the various drugs which are effective in malaria. The authors show quite definitely that the parasites in *P. lophurae* infection are themselves attacked by quinine, atebrin, and plasmochin. The mode of action of the drugs is not understood, but the end result is always degeneration of the parasite, evident from its changed appearance and from the delayed infection curves when blood from treated birds is used as an inoculum. No particular stage in the life-cycle of *P. lophurae* in the vertebrate host is affected, as all show degenerative changes provided that the drug is administered in sufficient quantity and over a long enough period. These observations on *P. lophurae* differ from those made on other species, in which quinine and atebrin are referred to as schizonticides and plasmochin as a gametocide.—C. HORTON SMITH.

VELÁSQUEZ Q, J. (1942). La fenotiacina. [**Phenothiazine**].—*Rev. Med. vet., Bogotá.* **11.** 516–521. **1616**

This is a review of present knowledge of the action of phenothiazine as an anthelmintic.—MILLER WATSON.

KOURÍ, P., BASNUEVO, J. G., & FERMOSELLE, J. (1943). Poder fasciolicida del chlorhidrato de emetina. [**Use of Emetine Hydrochloride in Human Fascioliasis**].—*Avance med., Habana.* **4.** 129–130. **1617**

Cases of fascioliasis in man were treated successfully with emetine hydrochloride. Careful examination showed that doses as low as 3·72 mg. per kg. weight of the patient were completely effective.—MILLER WATSON.

TWORT, J. M., & LYTH, R. (1944). **The Prophylactic Effect of a Colloid Material on the Skins of Mice Painted with Various Types of Carcinogenic Agents.** —*J. Hyg., Camb.* **43.** 252–255. [Authors' conclusions copied *verbatim*]. **1618**

A colloidal material (SD 2) delayed the advent of tumours when used in conjunction with benzpyrene, gas tar, or shale oil.

The protective action of this colloid exceeded that of lanolin when used alternatively with either benzpyrene or gas tar, but it afforded less protection than lanolin when used in conjunction with shale oil.

The incorporation of some 25% of lanolin in the colloid rendered it less effective than the original except possibly when used in conjunction with shale oil.

Skins rendered hyperplastic by the applications of benzpyrene gave a higher yield of tumours when subsequently treated with the colloid than when left untreated.

FOLGER, G. C. (1944). **The Treatment of Vaginitis in Cows Pre- and Postconception with Compound Silver Picrate Powder.**—*J. Amer. vet. med. Ass.* **104.** 73–76. **1619**

Following the effective use of this drug in allied human diseases, F. has treated over 500 cows of different breeds affected with either streptococcal or trichomonad vaginitis; the relative proportions of each type, and individual differential diagnoses, are not given. Apparent clinical cure followed rapidly. Details are supplied of 28 representative cases. Twelve of these cattle had returned to service at least three times before treatment was applied, after treatment eight became pregnant to either the first or second service. A somewhat higher proportion of pregnancies resulted in the cattle which had returned less frequently. No controls are referred to. In all but one of the 28 cases the uterus was considered to have been healthy.

Heifers, in which the disease is more acute, responded more rapidly to treatment than cows.

F. considers that these vaginites may be a cause of sterility. He believes the treatment not only alleviates the condition sufficiently to allow conception, but when applied shortly after service may prevent abortion which might otherwise result from the vaginitis.—F. L. M. D.

BEATTIE, J., HERBERT, P. H., WECHTEL, C., & STEELE, C. W. (1944). **Studies on Hepatic Dysfunction. I. Carbon Tetrachloride Poisoning Treated with Casein Digest and Methionine.**—*Brit. med. J.* Feb. 12th. 209–211. **1620**

An account of the treatment of a young adult who inadvertently swallowed 30–40 ml. of carbon tetrachloride. In the illness which developed the liver became enlarged and tender and there was a rise of serum bilirubin. He was treated with casein-digest-methionine intravenously, and with *dl*-methionine by mouth, and apart from a relapse on the third day following admission he made a rapid recovery. An attempt was made to follow the metabolism of the methionine administered, the daily N and S balances for the seven days following admission are given. It is suggested that on the two days following admission protein synthesis was impaired, but thereafter returned to normal. The retention of S is regarded as significant.—ALASTAIR N. WORDEN.

—. (1943). **A Glossary of Terms Used in Sex Hormone Therapy.** pp. 20. London: The Pharmaceutical Press. [8vo] [1s.] Reprinted from *Pharm. J.* (1943). **1621**

This is a very useful booklet which includes in the introduction a brief account of the nomenclature of steroids. The hormones of the pituitary, gonads and suprarenal cortex, their precursors, derivatives and synthetic analogues are briefly described, as are methods of their standardization and preparation. Oestradiol ethinyl is, strangely, omitted, although it is a useful oestrogen for oral administration. Various terms used in endocrinology, *e.g.* amenorrhoea, cryptorchidism, Graafian follicle, and in endocrine research, *e.g.* synergistic effect, are also defined.—J. M. ROBSON.

ILAND, C. N. (1944). **Pheme ride: A New Antiseptic Detergent.**—*Lancet.* **246.** 49–51. **1622**

This is a quaternary ammonium compound containing a long aliphatic chain and thus resembles CTAB which has been previously described [see BARNES—*V. B.* **12.** 557]. Laboratory tests suggest that phemeride is inhibitory to common pathogens in dilution not toxic to the tissues; it appears to be an efficient skin antiseptic and to have some effect on infection in thoracic wounds and fistulae. No sensitivity developed in six volunteers exposed for a fortnight. Further tests are obviously necessary.—J. M. ROBSON.

STOCK, C. C., & FRANCIS, T., JR. (1943). **Additional Studies of the Inactivation of the Virus of Epidemic Influenza by Soaps.**—*J. Immunol.* **47.** 303–308. [See also *V. B.* **11.** 522]. **1623**

Suspensions of virus were prepared from the lung or brain of infected mice, the supernatant being used for preparing higher dilutions of the virus. Tissue culture virus was also used. The soaps and detergents were all adjusted to pH 8 before use.

The action of oleate on the infectivity of influenza virus depended on the relative concentration of the agents but was rather rapid. It is claimed, however, that there was no extensive destruction of immunizing antigen, inasmuch as the treated virus induced an immunity in mice not greatly inferior to that obtained with active virus. The immunizing properties of vaccines were retested after one month's storage at 4°C. and were unimpaired.

Of the various new detergents tested, *viz*, Duponal L.S., zephiran, and aerosols OT, MA, AY, IB, and OS, only the first three rendered the virus non-infective.—JOHN FRANCIS.

HYGIENE AND PUBLIC HEALTH

WERDELIN, C. (1943). Konsummaelksmejeriernes tekniske Indretning. **[The Technical Equipment of Dairies—with reference to Filtration and Heat Treatment of Milk].**—*Maanedsskr. Dyrlaeger.* **55.** 297–319. **1624**

This is a description of a type of pasteurizing plant in common use in Denmark, with an account of an investigation on one plant which was found on occasion to turn out milk with an abnormally high bacterial content. Reinfection of the milk after heating had occurred *via* the centrifuge separator. Proposals are made for the disinfection of the latter and also for a slight alteration of the whole process.—J. E.

VIDAL, W. G. (1942). La mision del medico veterinario en la industria de las carnes y derivados. **[The Veterinarian's Place in the Meat Industry].**—*Bol. mens. Direcc. Ganad., Montevideo.* **26.** 185–192. **1625**

The author gives the reasons why the inspection of meat and meat products should be carried out by veterinary surgeons and calls for the establishment in Uruguay of a bureau of animal industry under veterinary direction.—MILLER WATSON.

MUCCIOLO, P., & DE PAIVA, O. M. (1940). Córtes de carne bovina em São Paulo—bases óssea e muscular dos diversos segmentos. **[Bony and Muscular Structure of Certain "Cuts" of Beef].**—*Rev. Fac. Med. vet. S. Paulo.* **1.** 179–204. **1626**

This is an anatomical description of the parts included in "cuts" of beef commonly sold in São Paulo.—MILLER WATSON.

See also absts. **1517** (control of hydatid disease), **1519**, **1523** (trichinosis).

TECHNIQUE AND APPARATUS

NELSON, E. C. (1943). **Alcohol-Preserved Tissue-Cultivation Medium. Methods of Preparation and Use and Results obtained in the Cultivation of** *Nyctotherus cordiformis.*—*Amer. J. Hyg.* **38.** 185–192. **1627**

The authors describe a culture medium the basis of which is alcohol-preserved tissue; they proved its value for the cultivation of *Nyctotherus cordiformis* from the frog, together with *Trichomonas augusta*, which normally accompanies this ciliate in the frog. A stock solution of the medium is prepared by finely pulverizing tissues—frog tissue was used—hardened in 95% alcohol, and the medium was made up as required by evaporating the alcohol and adding Ringer solution. Details of the preparation are given. Whole-tissue medium was found to be superior to either that made from the alcohol-soluble fraction or that from the insoluble fraction. Small initial inoculations in a small quantity of fluid were followed by a slow response or even death of the ciliates, and it is concluded that growth is in some way dependent on bacteria present in the cultures.—T. M. DOCKER.

RAVAGLIA, A. (1942). Sull'agar-avena come terreno colturale per i comuni microrganismi patogeni. **[Agar-Oat Extract as a Culture Medium for Common Pathogenic Bacteria].**—*Nuova Vet.* **20.** 234–235. **1628**

The medium is a modification of that introduced by MARVULLI (1941). 100 g. cleaned oats are allowed to soak with 300 ml. tap-water for 12–14 hours at 20°C., then brought slowly to the boil, boiled for 30 min., and filtered through cloth and then paper. To 100 ml. of

this are added 1 g. peptone and 0·5 g. NaCl; the medium is warmed, the pH is adjusted to 7·4, 2 g. agar are added, and the whole is autoclaved. The medium is transparent. The growth of colon-typhoid organisms, brucella, anthrax bacilli, staphylococci, streptococci, etc. was as rapid as on ordinary media, and the bacteria remained viable for similar periods.—J. G. CARR.

*PASS, G. (1942). Zur fluoreszenzmikroskopischen Darstellung von Tuberkelbazillen im Gewebe. **[Florescence-Microscopic Demonstration of Tubercle Bacilli in Tissue].**—*Wien. klin. Wschr.* p. 450. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 19]. **1629**

The method described is a combination of that of Hagemann and a so-called "polychrome fluorchrome" method. The tissues are put in succession through 0·1% auramine solution, 0·1% rivanol and either 0·01% bromphenol blue or in a mixture of trypan blue and congo red with some bromphenol blue or bromcresol purple added.

Tubercle bacilli appear as bright yellow rods in contrast-stained tissue. Cell nuclei and plasma are fluorchromed in such a way as to show a green-yellow fluorescence after differentiation in HCl-alcohol.—J. E.

TOM, N. (1943). **A Modification of the N. N. Medium for Cultivating** *Trypanosoma cruzi.*—*Amer. J. trop. Med.* **23.** 615–616. **1630**

The modified N.N. medium described consists of peptone broth which is sterilized by boiling, and then dispensed and autoclaved at 15 lb. pressure for an hour. As needed, 0·2% agar and one-third the volume of sterile defibrinated rabbit blood are added, and the medium again sterilized in the autoclave for 20 min. The results were approximately the same as those obtained with N.N. medium.—U. F. RICHARDSON.

*BESSEMANS, A., WITTEBOLLE, P., & BAERT, H. (1942). Le micromanipulateur pneumatique et les granules d'une souche de leptospire aquicole non pathogène. **[The Pneumatic Micromanipulator and the Granules of a Non-Pathogenic Strain of Leptospira].**—*Bull. Ass. dipl. Microbiol. Fac. Pharm., Nancy.* (?) No. 24/25. pp. 61–76. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 296–297]. **1631**

By using the pneumatic micromanipulator it was found possible to isolate individual leptospira of a non-pathogenic water strain from cultures which had been mixed with antisera and maintained at 5°C. for a day, and to raise subcultures from them. Subcultures were also grown from granules obtained in the same way from cultures which had been heated to 56°C., and cultures which had been exposed to an antiserum for ten days. It is not considered that the granules can be explained as either degenerative or resistant forms. —U. F. RICHARDSON.

KUHN, F. (1942). Über die Sublimattitration des Blutserums bei Pferd, Rind und Schaf. **[Sublimate Titration of Blood Serum in the Horse, Ox, and Sheep].**—*Wien. tierärztl. Mschr.* **29.** 458–459. [Only abst. given]. **1632**

The sublimate test, *i.e.* observations on the precipitation of serum proteins by the addition of 0·1% $HgCl_2$ solution, has been found useful as a nonspecific test of diagnostic and prognostic value in many diseases, such as TB., fascioliasis, pleurisy, peritonitis, nephritis, suppurations etc., as well as of diagnostic value in special forms, as in Fulton's test for trypanosomiasis.

This dissertation is concerned with the finer points of technique and the exact determination of arbitrary degrees of precipitation and the amounts of $HgCl_2$ solution required to produce "beginning precipitation" and "complete precipitation". K. appears to favour the "complete precipitation" titre as a practical basis for the test. Some figures relative to his method are given.

It has been shown that it is serum globulin that is precipitated by $HgCl_2$.—J. E.

SCHREK, R. (1944). **A Method for Mounting Gross Pathologic Specimens in Petri Dishes.**—*J. Lab. clin. Med.* **29.** 91–96. **1633**

A simple method for mounting surgical and autopsy specimens in petri dishes is described. The specimen is usually left free in the petri dish, or may be fixed by adhesive plaster, or by sewing on to a piece of transparent film. The dish is filled with the mounting fluid in a large pail to exclude bubbles. It is then inverted and withdrawn from the pail. The space between the edge of the lower and upper plate, around the circumference, is filled up with white twine and plasteline, the free edge of which is then shellacked. —R. COOMBS.

EWER, T. K. (1942). **Lamb Castration and Docking.** —*N.Z. J. Agric.* **65.** 337–339. **1634**

It was concluded after one season's trial with the searing iron and knife methods of docking and of two seasons' trial with the bloodless emasculator and knife methods of castration, that in no case was there any subsequent difference in either growth rate or mortality. —M. B. BUDDLE.

DEY, B. B., KRISHNAN, P. S., & SRINIVASAN, V. (1943). **Studies on the Preservation of Glands. I. The Preservation of Adrenal Glands.**—*Current Sci.* **12.** 244–246. **1635**

A note concerning the procedure for dealing with adrenal glands at slaughterhouses in India, for the preparation of adrenalin. A project is apparently in hand for the construction of a central factory for the large-scale production of gland products.—A. N. W.

See also absts. **1463** (diagnosis of trichomoniasis), **1471** (conservation of viruses by desiccation), **1530** (isolation of chromatin threads from leucaemic cells).

MISCELLANEOUS

SERGIEV, P. G. (1942). Sezdy i soveshchaniya po voprosam mikrobiologii i epidemiologii. **[Conferences and Congresses on the Problems of Microbiology and Epidemiology].**—*Zh. Mikrobiol., Moscow.* No. 11/12. pp. 94–97. **1636**

From 1919–28, 11 All-Union congresses were held on various aspects of microbiology and epidemiology. There were exceedingly large attendances at these congresses and very large numbers of papers were presented. Later, they were replaced by more specialized conferences which are held separately in provinces and individual republics. The representatives of the provinces later meet and make recommendations on the questions raised in the conferences.—A. M.

*—. (1943). Das eidgenössische Vakzine-Institute in Basel. **[The New Federal Vaccine Institute, Basle].** Bern: Hans Huber. [Sw.Fr. 3]. [Abst. from review in *Skand. VetTidskr.* **33.** 639]. **1637**

This new Swiss vaccine institute was built during the year beginning September, 1941, and is intended primarily for the production of foot and mouth disease vaccine [see *V. B.* **12.** 560], although provision has been made also for the study of other virus diseases.

The institute stands by the side of Basle abattoir and uses the denaturator plant of the abattoir in order to obtain valuable by-products from the carcasses of animals that could not otherwise be utilized. The institute is designed so that it may be isolated with certainty from the outside world and nothing unsterilized is allowed out of it. Heat treatment to overcome infection is applied to both the air and waste water, the air by passage through an oil bath filter and water by being heated to 80°C. for 20 min. There is accommodation for 38 vaccine-producing cattle. Staff in contact with infection change their clothes on entry and departure and undergo disinfectant showers before leaving. The total cost of construction was 1,600,000 Sw.frs.—J. E.

HERRLEIN, H. G. (1940). **A Practical Guide on the Care and Uses of Small Animals for Medical Research.** pp. 71. New City, N.Y. : Rockland Farms. [8vo]. **1638**

This useful booklet deals with the principles of housing and cage construction, and with the feeding and management of the common laboratory rodents ; a short section is devoted to hygiene and disease control. Various types of animal house and appliances recommended are shown in numerous photographs. A particularly useful feature is the history and origin of some of the commoner strains of mice, rats, g. pigs and rabbits used in American laboratories, in which is mentioned the suitability of particular strains for different experimental investigations. There is a bibliography of 89 references, citing publications dealing with the breeding, feeding, diseases, and experimental uses of laboratory rodents. In the introduction to the booklet H. emphasizes " the great need for uniformity in housing, diets, weight curves, and the adoption of known strains of small animals, while working toward a general standardization ".—N. J. SCORGIE.

BURROW, H. (1944). **The Advantages and Disadvantages of Livestock Marketing.**—*Vet. Rec.* **56.** 17. Discussion pp. 18–20. **1639**

B.'s main theme in this discussion is that the present methods of marketing store cattle, dairy cows, and calves are open to serious criticism on the ground that there is no check on the sale of unfit and unhealthy animals. There are, also, too many saleyards where the conditions of stalling and penning the stock are inadequate to protect the animals against the rigours of climate conditions, and where no precautions are taken to limit the spread of disease. The exposure of newly calved cows and of young calves at public markets is deprecated because of the susceptibility of such animals to various types of illness. The majority of subsequent speakers in the discussion agreed that there was need for improvement in the measures for the control of disease at sales. Some suggestions were made as to possible ways in which this might be achieved, although several speakers were careful to point out fundamental differences in effecting this improvement. Regulation of known and proved abuses in livestock marketing should be agreed upon by collaboration between farmers, auctioneers, dealers, and traders in animal products, with the advice of the veterinary profession.—N. J. S.

FALCIONI, A. C. (1943). Algunos elementos de juicio para facilitar la clasificación y tipificación de las reses de carnicería. (Bovinos). **[Standards for Grading Bovine Carcasses].**—*Rev. Med. vet., B. Aires.* **24.** 233–245. **1640**

F. reviews the characters on which bovine carcasses can be graded, such as sex, age, breed, conformation, condition, and quality.—MILLER WATSON.

—. (1943). **Animal. Diseases of Animals. The Transit of Horses, Asses and Mules Order of 1943. Dated October 11, 1943.**—*Statutory Rules & Orders, 1943.* No. 1460. pp. 2. London : H.M. Stat. Off. [8vo] [1d.] **1641**

This Order extends the scope of the exportation and transit of horses, asses and mules Order of 1921 and subsequent amendment orders to include the carriage of these animals by road vehicles.

Under the new provisions it is an offence to convey an unfit animal by road if unnecessary suffering is likely to be caused thereby, and inspectors of the Ministry of Agriculture are empowered to issue notices forbidding such carriage by road if necessary.—J. C. BUXTON.

HAGAN, W. A. (1943). **Veterinary Education in the Postwar World.**—*J. Amer. vet. med. Ass.* **103.** 269–274. **1642**

At the outset, H. develops the theme that at the end of the present war, America will have to play a leading role in reconstruction and will have to continue to supply much of the food as well as many of the tools and materials of peace.

Having dealt in general terms with the pre-war history of veterinary education in America from the end of the war of 1914–18 up to 1929, during which period the veterinary colleges in the U.S.A. first suffered from a lack of students and money, and later experienced prosperity, due to the comparatively good prospects offered by such a career in a world of industrial depression, H. outlines the alterations which he considers necessary to raise veterinary education to the standard which will be required of it.

He considers that some veterinary schools are accepting classes too large for their staffs and facilities, with the result that training in manual skill is subordinated to " mass mental instruction and book learning ". Beyond this is the failure, in a large measure, to carry over to clinical teaching the basic scientific knowledge acquired in the early part of the curriculum, with the result that, due to ignorance, young veterinarians frequently mishandle cases. H. suggests that this is largely due to the fact that most clinical instructors are men with faulty educational backgrounds who tend to rate the art of veterinary medicine higher than the science and thereby to work upon too empirical a basis. He therefore advocates for veterinary clinical instruction the application, in a suitably modified form, of the method employed in medical schools, whereby frequent chemical and bacteriological tests applied before, during, and after treatment, not only provide pictures of individual cases, but also familiarize students with the methods employed.

Veterinary education will need to be extended after the war and since it would not be desirable to stretch basic teaching beyond the present period of five years, the alternative suggestions put forward are that there should be either a two-years' pre-professional programme, embracing such subjects as chemistry, English and zoology, followed by a four-years' course, or a one-year pre-professional programme followed by a five-years' course. It is considered that either would be sufficient for the training of practitioners and that graduates wishing to become teachers or research workers should take an additional degree course lasting one or two years.

In view of the recent increases in knowledge, additional training is needed in nutrition, virus diseases, and parasitology and it is suggested that this should be given at the expense of detailed anatomical dissection which is soon forgotten and seldom used afterwards. More time should be available for students in the later years to work independently and thus the method of

clinical teaching which enables the student to follow particular cases to their conclusions should be adopted and clinical instructors additional to lecturers appointed, thereby producing the low instructor-student ratio necessary for sound future veterinary education.
—J. C. BUXTON.

—. (1943). Faculdade de Medicina Veterinária da Universidade de São Paulo. **[The Faculty of Veterinary Medicine, University of Sao Paulo].**—*Bol. Soc. brasil. Med. Vet.* **12.** 143–146. **1643**

The Faculty of Veterinary Medicine was founded in 1935 and took the place of a veterinary college founded in 1928. The course of study at the Faculty covers a period of four years and the curriculum is divided into 16 subjects. At present there are 44 students. The Faculty is well equipped with good laboratories and apparatus.—MILLER WATSON.

—. (1943). Pedido de un cuerpo sanitario atendido por médicos veterinarios en el jardín zoológico de Buenos Aires. **[Request for the Appointment of Veterinary Officers at the Zoological Gardens, Buenos Aires].**—*Gac. vet., B. Aires.* **5.** 129–133. **1644**

This is a request by an Animal Protection Society to the head of the municipal authorities of Buenos Aires. It calls for the appointment of official veterinary surgeons to the Zoological Park in order that the animals may be kept under competent supervision. It calls attention to heavy losses among the animals and the danger of diseases transmissible to man being overlooked by laymen.—MILLER WATSON.

—. (1944). Lov av 25. november 1943 om sivil tjeneste m. v. for laeger, tannlaeger og veterinaerer. **[Norway: Law of Nov. 25th 1943 on Civil Appointments for Doctors, Dentists, and Veterinary Surgeons].**—*Norsk VetTidsskr.* **56.** 29–30. **1645**

This order lays down the conditions of regimentation of persons of the above three professions. The chief service liability is one of location, *i.e.* work must be done at places designated by the Government. Disobedience is punishable by a heavy fine or imprisonment.—J. E.

REPORTS

GREAT BRITAIN. (1943). **Summary Report of the Ministry of Health for the year ended 31st March, 1943.** pp. 56. London: H.M. Stat. Off. [8vo] [1s.] **1646**

Two points of comparative veterinary interest are discussed. The total number of deaths from TUBERCULOSIS during the year was 25,547, about the same figure as in the last pre-war year, 1938. There was a rise of 3% in the number of new cases notified. The causation is not discussed.

Steps were taken to prevent as far as possible the serious loss of milk which occurred through souring during the first two years of the war and local authorities were requested to try to fulfil their obligations under the Milk and Dairies orders and regulations.—D. D. O.

GREAT BRITAIN. (1942). **London School of Hygiene and Tropical Medicine (University of London) Incorporating the Ross Institute. Report on the Work of the School For the Year 1941–42.** [PARKINSON, G. S.] pp. 43. London: The School. [8vo]. **1647**

DEPARTMENT OF CLINICAL TROPICAL MEDICINE.—The action of sulphaguanidine and sulphamezathine was tested in cases of ulcerative COLITIS. Promising results have attended the use of rectal retention enemas.

DEPARTMENT OF PARASITOLOGY.—Observations were continued into the incidence of undiagnosed TRICHINOSIS. Up to 1942, over 400 diaphragms had been examined for trichinae, approximately 10% being found infected. Over 4,000 freshly killed pigs were also examined, but no case of infection was detected.

DEPARTMENT OF ENTOMOLOGY.—A survey was carried out in northern England and in Wales of regions infested by *Ixodes ricinus*. New insecticides were being tested against the tick.

DEPARTMENT OF BIOCHEMISTRY.—Research was directed chiefly to antibacterial substances from moulds. The results indicate widespread production by moulds of highly active antibacterial substances of very varied chemical composition. Among these the following have received special attention:– citrinin from *Penicillium citrinum* Thom, penicillic acid from *P. puberulum* Bainier and *P. cyclopium* Westling, spinulosin from *P. spinulosum* Thom, fumigatin from *Aspergillus fumigatus* Fresenius, and puberulic acid and puberulonic acid from a number of species of *Penicillium*. A new species of *Penicillium*, *P. resticulosum* sp. nov., had been shown to produce an antibacterial substance of undetermined chemical composition. This substance and another of similar type from *P. lagerheimi* Westling were under examination during the year.

INSTITUTE OF AGRICULTURAL PARASITOLOGY.—The use of phenothiazine in the treatment of HELMINTHIASIS of sheep and goats continued to receive attention and experiments were conducted to assess the relative value of single and multiple doses.

A human case of *Coenurus cerebralis* infection was recorded for the first time in Britain.

A census was made of LIVER FLUKE INFESTATION in home-bred and imported cattle.

Investigations were continued into the role of wild birds in spreading helminthiasis in poultry and game birds and on the relationship of coenuri in rodent and ovine hosts.—D. D. OGILVIE.

GREAT BRITAIN. (1942). **The Lister Institute of Preventive Medicine. Report of the Governing Body, 1942.** pp. 24. London: The Institute. [4to]. **1648**

Research of comparative interest included work on TRICHOMONIASIS, toxin production of *Clostridium welchii*, the biochemistry of bacterial toxins (*Cl. welchii* and *Cl. oedematiens*), the metabolism of fat, the fattening of pigs, and the photosensitizing action of buckwheat (*Fagopyrum esculentum*).

In TRICHOMONIASIS, especial attention was given to the agglutination reaction of certain species of trichomonads in sera. This work formed the theoretical basis for the practical application of the serological test for *T. foetus* infection in cattle. Field observations showed that the test affords a clear diagnosis in certain types of case. It is specific in the sense that no other infection in cattle has been found to raise the normal titre for T. foetus and that the characteristic reaction is associated with clear cases of trichomonas abortion. The test, however, is not diagnostic of the mere presence of the organism and a negative result cannot be accepted as a good indication that an animal is free from infection.

Resulting from the work on the photosensitizing action of buckwheat, a non-crystalline powder has been prepared which has about 90 times the activity of the dry buckwheat flowers originally employed at the beginning of the experiments.—D. D. OGILVIE.

GREAT BRITAIN. (1943). **Colonial Development and Welfare Act 1940. Return of Schemes made under the Colonial Development and Welfare Act, 1940, by the Secretary of State for the Colonies with the concurrence of the Treasury in the Period from 1st November, 1942, to 31st March, 1943.** pp. 4. London: H.M. Stat. Off. [8vo] [1d.] **1649**

The following schemes of veterinary interest were approved.

Development and Welfare.—To the Secretary of State for the Colonies for agricultural and veterinary scholarships on behalf of all dependencies with agricultural and veterinary departments, £100,000; to British Guiana for a veterinary surgeon in the Rupununi District, £6,000, and stock farm extension, £31,300; to St. Christopher & Nevis for a Government stock farm, £7,720.

Research.—To Tanganyika Territory for RINDERPEST control—(i) protective fence along Tanganyika-Northern Rhodesia border for 50 miles and (ii) research into part played by game as reservoirs and carriers of rinderpest, £7,640.

Since the introduction of the Act in July 1940 and up to 31st March 1943, a total of £3,706,087 has been authorized, £499,200 as loans and £3,134,389 as grants for schemes for development and welfare and £72,498 for research.—J. A. GRIFFITHS.

CANADA. (1943). **Report of the Veterinary Director General for the year ended March 31, 1943.** [CAMERON, A. E., & BARKER, M.] pp. 41. Ottawa: Edmond Cloutier. [8vo]. **1650**

Except for a short period in March, the Division was under the direction of Dr. A. E. CAMERON who retired after long service on March 7th, 1943.

The health of Canadian livestock continues at a high level. War conditions have curtailed TUBERCULOSIS eradication work, but even so substantial progress has been made.

REPORTS OF CONTAGIOUS DISEASES SECTION.—There was no case of ANTHRAX; the last outbreak was in 1941. Under the accredited herd plan 275,929 cattle were tested for TUBERCULOSIS and 0·1% reacted; in area testing 998,364 cattle tested showed 1·1% reactors; under the supervized herds plan 51,426 tests showed 0·4% reactors. Altogether 10,978 reactors were slaughtered and the average compensation paid was $33.10 per animal. No cases of GLANDERS occurred; 742 horses and mules were tested. In eight outbreaks of SWINE FEVER, 3,550 pigs were slaughtered. In two outbreaks of RABIES, 12 animals were infected. There were no cases of MANGE in horses, but in two outbreaks of cattle mange, five animals were infected.

Animals inspected for export numbered 558 horses, 401,572 cattle, 1,345 sheep, 258,830 pigs, and 7 goats.

REPORT OF MEAT AND CANNED FOODS SECTION [MACONACHIE, C.]—Exports from 91 establishments under inspection amounted to over 1,320 tons. The total number of cattle and calves slaughtered was 1,568,886, of sheep 832,070, pigs 6,140,614, and poultry 970,437. These figures are decreases on those of 1941–42. Carcasses condemned were cattle 1·8%, sheep 0·32%, pigs 0·19%, and poultry 1·28%. The main causes of condemnation were :–

TUBERCULOSIS—cattle 43·40% and pigs 39·31%; emaciation and mucoid degeneration—cattle 13·71%, calves 21·42%, and sheep 36·48%; immaturity in calves 50·76%; PNEUMONIA—cattle 6·46%, sheep 22·82% and pigs 4·66%; PYAEMIA and SEPTICAEMIA—cattle 6·61% and pigs 6·82%.—J. A. GRIFFITHS.

INDIA. (1941). **Imperial Council of Agricultural Research. Agriculture and Animal Husbandry in India 1938–39.** pp. iii + 422. Delhi: Manager of Publications. [8vo] [Rs. 6 or 9s. 6d.] **1651**

During the year, the Council ceased to be a separate Department of the Government of India and was placed under the Department of Education, Health and Lands. The Third Meeting of the Animal Husbandry Wing of the Board of Agriculture and Animal Husbandry was held in February and a Conference of Ministers on Agricultural Marketing in November.

The depression in the price of agricultural products, which started in the latter part of 1937, continued. In spite of this a steady improvement was maintained in respect of the various animal husbandry schemes operating under the auspices of the Council, *e.g.* the improvement of goats, sheep, and poultry; investigations into a number of animal nutrition problems peculiar to the country; an enquiry into the efficacy of indigenous drugs and their possible utilization on a much larger scale; research into the warble-fly pest; the formation of milk-recording societies, and the establishment of herd books. Much useful veterinary research was carried out during the year, the notable feature being the extended investigations into the diseases of sheep, goats, and poultry. The scheme sanctioned by the Council in 1934 to test the efficacy of the goat-virus method of vaccination against RINDERPEST terminated during the year, showing that this method of inoculation gives very satisfactory results.

The Second All-India Cattle Show was held in February and preparations were made for a livestock census to be held in January, 1940.

Veterinary and agricultural education continued to make progress and reports indicate that a larger number of candidates are being attracted to an agricultural career.

Faith in the Co-operative Movement as an effective lever for village uplift remained undimmed in spite of adverse economic conditions.—L. H. SHIRLAW.

SIERRA LEONE. (1943). **Annual Report of the Department of Agriculture For the Year 1941.** [MARTIN, F. J.] pp. 10. Freetown: Govt. Printer. [8vo] Items of veterinary interest p. 4. **1652**

To ensure adequate provision of food for the population the improvement of livestock in the Colony is urgently required. To this end a veterinary officer has been appointed, but he did not arrive during the year.

The remainder of the report deals entirely with agricultural matters.—D. D. OGILVIE.

NYASALAND PROTECTORATE. (1943). **Annual Report of the Veterinary Department for the Year ended 31st December, 1942.** [DE MEZA, J.] pp. 8. Zomba: Govt. Printer. [4to]. **1653**

Diseases—The general position of animal health was not as good as in previous years. There was no change in the TRYPANOSOMIASIS position in the areas where the disease is enzootic, but there was a considerable increase in the number of outbreaks discovered in the Dowa district. These new centres of infection are attributed to the spread of tsetse fly through an increase in traffic between Salima rail head and Lilongwe. This route passes through tsetse fly zones and the flies are carried on lorries and even by cyclists to clean areas. There were also three outbreaks in the Southern Province whose source could not be traced. The treatment of native-owned cattle has been by tartar emetic and most of the animals recovered. A few European-owned cattle were treated successfully with phenanthridinium compound. Tsetse fly surveys have been carried out in several areas, in particular along the northern extension of the railway between Salima and Blantyre, and also in the North Nyasa and Mzimba districts. In the Fort Manning and Kasunga districts, forest clearings

are proving successful in reducing the spread of tsetse fly. There was an increased incidence of EAST COAST FEVER in the Northern Province. Measures are being enforced to enable the department to control the disease in the enzootic areas. Cattle registers are maintained and owners are provided with stock cards. Notification of deaths is compulsory and to enable diagnosis to be made, spleens must be produced. The position regarding other tick-borne diseases was good.

Control measures for RINDERPEST were confined to the border patrols on the Tanganyika and Northern Rhodesia borders of Nyasaland. The African guards used are in two groups, armed hunters, to drive back or destroy game crossing the border, and police who patrol the lower reaches of the Songwe river.

There was an increase in the number of outbreaks of RABIES reported. Nine cases were confirmed in six districts.

There were a few cases of HORSE SICKNESS, CANINE PIROPLASMOSIS, REDWATER in cattle, and one severe outbreak of ANAPLASMOSIS in a European-owned herd in the Southern Province. Helminths in calves caused many deaths. Powders for treatment are issued to natives without charge.

Animal husbandry.—The general position of livestock is described as good and future prospects as better than ever before. Increased demands for dairy produce have stimulated the expansion of the industry by European dairymen, who have imported pure-bred bulls and heifers, and there is an increased interest in the development of poultry keeping. There is also a satisfactory increase in the native-owned herds.

A poultry experimental unit was maintained at Lilongwe and much useful information was obtained by the veterinary officer who is in charge.

Marketing of animals and animal products.—The greater part of the time of the staff was devoted to this work. This included the purchase of cattle for military food supply. There is an increase in the consumption of meat by natives and this, together with the demands for military purposes, has provided a market for the surplus cattle, sheep and goats. Ghee production has shown a satisfactory increase. The supply of dairy produce for the towns of the Southern Province is adequately maintained by the European firms who cater for this market. They maintain herds of Friesland, Jersey, and grade cattle.—J. A. GRIFFITHS.

—. Committee Reports Adopted at the Eightieth Annual Meeting [of the American Veterinary Medical Association], August 25–26, 1943.—*J. Amer. vet. med. Ass.* **103.** 319–356. **1654**

Notes of general interest are taken from the reports of the following special committees of the A.V.M.A.

EDUCATION (pp. 319–321).—Up to December 31st, 1942, a considerable number of veterinarians had entered military service. The quota for additional veterinary officers for the Army for 1943 was fixed at 900.

From nine accredited veterinary colleges, 415 students graduated during the year. As a war measure the course has been slightly curtailed.

Anxiety is expressed regarding the small number of students undergoing pre-veterinary training.

A scheme was introduced by the Army for recruitment into the Veterinary Corps. All medically fit students must enlist in the Reserve Corps as privates. They wear uniform, live in barracks, and receive private's pay. In addition to their professional studies, they are required to undergo military training.

It is recommended that 12 veterinary colleges be placed on the accredited list for the year 1943–44.

RESOLUTIONS (pp. 321–322).—A resolution was passed by the Association deploring the transfer of the meat-inspection service of the U.S. Department of Agriculture from the Bureau of Animal Industry to the Food Distribution Division of the Department of Agriculture and requesting that the meat-inspection service be re-established as a division of the B.A.I.

BIOLOGICAL PRODUCTS (pp. 322–323).—No new biological products were accepted during the year. Up to the present 4 antitoxins, 14 sera, 2 aggressins, 3 diagnostic agents, 2 toxoids, 14 vaccines and viruses, and 5 bacterins have been approved. There remain 61 biological products prepared under U.S. Bureau of Animal Industry licence which have not yet been recommended for acceptance. Attention is directed to the widespread improper use of several biological products, especially those against haemorrhagic septicaemia and the mixed bacterins.

PUBLIC RELATIONS (pp. 324–327).—The committee estimated annual losses of livestock. These are stated to be 30–40% of the pig crop, 20% of the calf crop, and 25–30% of pullets. The committee considers that a high proportion of the losses could be eliminated by veterinary supervision. Consideration of a scheme of animal health insurance to provide adequate veterinary service for all is advocated.

POULTRY DISEASES (pp. 327–328).—A National Poultry Advisory Council has been formed to direct the poultry disease control programme.

During the year FOWL POX occurred in unusually high incidence in the Middle West. INFECTIOUS BRONCHITIS was generally widespread among chicks. In California outbreaks of AVIAN PNEUMOENCEPHALITIS were recorded in turkeys as well as in chickens. FOWL PARALYSIS was regarded as increasing in incidence in turkeys. After a lapse of ten years, FOWL CHOLERA and FOWL TYPHOID appeared in Kansas. New species of coccidium (*Eimeria brunetti*) was recorded in chickens in New York. HEXAMITA infection and *Leucocytozoon smithi* infection in turkeys have each been reported from additional states. *Erysipelothrix rhusiopathiae* infection is reported in turkeys for the first time. The formation of soft-shelled eggs following sulphonamide administration to hens and turkeys was recorded.

HISTORY (p. 330).—The committee has now completed a survey of municipal meat-inspection in the U.S.A. It is hoped shortly to prepare a history of the state livestock sanitary services and eventually to produce a complete history of the U.S. veterinary profession.

RABIES (p. 330).—The committee co-operated in the work of the National Committee on Rabies which is responsible for the control of the disease on a national basis. No new data regarding the disease are given.

NOMENCLATURE OF DISEASES AND VITAL STATISTICS (pp. 330–331).—No meetings of the committee were held and it is unlikely that this committee will meet again during the war.

PARASITOLOGY (pp. 331–333).—The committee has considered the instruction requirements in parasitology for veterinary students. It is recommended that there should be a separate department of parasitology in each veterinary college and that at least one member of the college staff should be a parasitologist.

FOOD HYGIENE (p. 333).—The committee advocates the establishment of a national system of poultry inspection of the same type as that of the Federal meat inspection service.

BRUCELLOSIS (pp. 334–335).—Progress in control and eradication of brucellosis has been slower than in previous years, due mainly to shortage of veterinarians.

The number of cattle tested declined by 28% compared with the previous year and averaged 425,000 per month. There has been a steady increase in the number of calves vaccinated, and an average of about 20,000 per month has now been reached. Generally there is a tendency to retain positively reacting adult cattle in contact with vaccinated calves, and it is said that best results follow this procedure. Vaccination of adult cattle with strain 19 is widespread although it is contrary to official recommendations. Research into brucellosis in swine is in progress.

THE INTERSTATE SHIPMENT OF LIVESTOCK BY TRUCK (pp. 335–337).—An amendment to the present law was formulated. This limits the period of continuous confinement of animals on cars, motor vehicles, or vessels to 28 hours after which they must be unloaded into suitable pens for at least five hours.

VETERINARY MEDICINE AND THE WAR (p. 337).—The committee dealt with occupational deferment of veterinarians from military service and the forming of local committees in each state to deal with this.

DISEASES OF HORSES (pp. 338–341).—No cases of GLANDERS have been recorded since 1938. DOURINE has recently become more widespread. During the year 79,013 horses were tested and 905 gave positive results. EQUINE INFECTIOUS ANAEMIA also appears to be increasing in incidence. The disease is endemic in the Mississippi delta and occurs elsewhere sporadically. PERIODIC OPHTHALMIA is limited mainly to the eastern states where the incidence may reach 30%. INFLUENZA and STRANGLES are widespread. Practically all cases arise in auction markets. EQUINE ENCEPHALOMYELITIS has now been reported from all but three of the states. Since 1935, 447,813 cases of the disease have been recorded. The report also deals with equine breeding problems, phenothiazine as an anthelmintic for horses, and equine nutrition.

DISEASES OF SMALL ANIMALS (pp. 341–345).—MALNUTRITION and RABIES are discussed. The main effects of lack of meat for feeding dogs are seen in puppies which are frequently deficient in stamina and are of poor physique.

LEPTOSPIROSIS is regarded as next to distemper in severity and prevalence. The incidence of the disease in man is said to be increasing. It is considered that DISTEMPER immunization frequently gives unsatisfactory results, and it is suggested that comparative trials should be made with the different methods in use, in order to ascertain the most suitable methods.

DISEASES OF BEEF CATTLE (pp. 345–348).—KERATITIS was widespread throughout the U.S.A. The cause is unknown. Treatment is unsatisfactory. MASTITIS was common in beef cows and caused severe losses. Experimental work indicated that sulphapyridine was effective against the many diseases associated with *Fusiformis necrophorus* infection. Outbreaks of COCCIDIOSIS were common in young animals. There were indications that sulphaguanidine might be of some value in treatment of the condition. TRICHOMONIASIS is also widespread and has now been reported from about 75% of the states. Present methods of diagnosis are regarded as unsatisfactory. Outbreaks of PNEUMONIA in calves and steers were common ("SHIPPING FEVER"). Treatment with sulphathiazole was generally helpful. Good results followed intravenous injection of a mixture of potassium guaiacol sulphonate, sodium iodide, alcohol, and distilled water when this was used early. URINARY CALCULI occurred frequently in steers in the corn-belt. The causation is unknown.

JOINT COMMITTEE ON FOODS (pp. 348–351).—Recent food orders have limited the volume of protein in dog foods to 24% of which not more than 8% may be of animal origin. Recommendations are made for substitute feeding for dogs in wartime.

SUB-COMMITTEE ON VETERINARY ITEMS, NATIONAL FORMULARY COMMITTEE (p. 352).—Until recently the U.S.P. and N.F. have been revised every ten years. This is now considered inadequate and continuous revision with the issuing of supplements is to be undertaken.

RESEARCH COUNCIL (p. 352).—The functions of the Research Council are to appoint research fellows and to assist in the production of the *Amer. J. Vet. Res.* No fellowships were granted during the year.

REPRESENTATIVE TO THE INTER-ASSOCIATION COUNCIL OF ANIMAL DISEASES AND PRODUCTION (pp. 352–354).—The council has been engaged chiefly in stimulating livestock owners to reach the production goals set them by the authorities. Suitable propaganda has been provided for work concerning the production of dairy cattle, sheep, goats, and pigs.

REPRESENTATIVE TO THE DIVISION OF BIOLOGY AND AGRICULTURE, NATIONAL RESEARCH COUNCIL (p. 355).—The division has set up an Animal Health Committee which will work in association with the Inter-Association Council of Animal Disease and Production.

REPRESENTATIVE TO THE HORSE AND MULE ASSOCIATION OF AMERICA (pp. 355–356).—The object of the association is to encourage the breeding of horses and mules. At present more than 12,000,000 horses and mules are working on farms and there are about another 500,000 saddle horses on farms and ranches in the U.S.A. There is a growing demand for mules from the Army. A serious shortage of young work stock is evident and intensive breeding is advocated. Two-thirds of all farms in the U.S.A. are operated exclusively by animal power and in nearly all others there are at least one or two pairs of horses. It is unlikely, therefore, that the demand for horses will diminish for many years.

—D. D. OGILVIE.

U.S.A., NEW YORK STATE. (1942). **Annual Report of the Division of Laboratories and Research, 1942.** [WADSWORTH, A. B.] pp. 115. New York: State Department of Health. [8vo]. **1655**

RESEARCH AND SPECIAL INVESTIGATIONS.—Work was done on the serological investigation of virus infection. The activity of soil micro-organisms and their products was studied. Intravenous injection of pneumococcus carbohydrate, meningococcus protein, and streptococcus toxin into groups of horses and goats previously employed for serum production resulted in a well defined symptom complex and gross pathological changes. All horses after injection of 30–60 ml. of pneumococcus carbohydrate solution showed restlessness, trembling, weakness, rapid pulse, and dyspnoea. A number died. Autopsies showed endocardial haemorrhages, petechiation, pulmonary haemorrhage, and congestion of the intestines and kidneys. Eight goats receiving 12–20 ml. of a 1 : 200 protein fraction of meningococcus type I intravenously showed similar symptoms. Five died within 24 hours and one within 48 hours. Autopsy showed general congestion of the viscera and petechiation.

Of 110 horses under immunization with meningococci, 14 developed endocarditis with valvular lesions of the left heart. The gross pathology and histopathology of the condition is described.

In studies of haemolytic streptococci of animals more than 90% were shown to be members of the serological group C. The organisms were isolated mainly from boils, abscesses, superficial sores and lung lesions of horses.

In the immunization of horses against different

strains of pneumococcus type 2 it was found that by changing the schedule of dosage it was often possible to continue the injection of a sensitive horse without untoward reaction.

Extensive amyloid degeneration of the liver occurred in horses immunized over long periods with bacterial toxins.

Outbreaks of disease with relatively high mortality occurred in the laboratory animals. These comprised PNEUMONIA in g. pigs, associated with *Brucella bronchiseptica*, PNEUMONIA in rabbits and g. pigs, associated with a group C haemolytic streptococcus, and a disease of unknown aetiology in ferrets characterized by leucopenia, emaciation, and weakness. The last condition may have been due to CREOSOTE POISONING.

ANTITOXIN, SERUM AND VACCINE LABORATORIES.—Calcium-precipitated toxin proved satisfactory in the immunization of horses against streptococci. Investigation was being made of inhibitory substances produced by a sulphonamide-resistant strain of streptococcus isolated from the blood of a horse. The chemotherapy of meningococcal bacteraemia in two horses was studied. The condition responded favourably to sulphapyridine medication. A test was made of the immunizing value of tannic acid precipitated streptococcus toxin.

DIAGNOSTIC LABORATORIES.—A fluorescence technique for the detection of acid-fast bacilli was worked out.

Tuberculin tests on 66 g. pigs with 0·1 ml. of 5% tuberculin confirmed the usefulness of the test in the early diagnosis of g. pig TB.

An outbreak of SEPTIC SORE THROAT in a small village of 275 inhabitants was traced to one cow out of 6,000 animals in 356 herds. The cow was excreting group A haemolytic streptococci in the milk.

The high incidence of TRICHINOSIS is recorded. Pork butchered on the farm and inadequately cooked is a common source of infection. Two epidemics are described with three deaths. In one epidemic sausage was so heavily contaminated that numerous trichinella were easily demonstrated in teased preparations taken at random.

Several cases are also recorded in human beings of TULARAEMIA contracted from muskrats.

LABORATORIES FOR SANITARY AND ANALYTICAL CHEMISTRY.—The use of Pyrex suspensions in the resazurin test for milk grading is suggested. Experience has shown that Pyrex turbidity suspensions might be employed as standards to overcome the difficulties of preparing resazurin-treated milk in the laboratory.

LABORATORY FARM.—An account is given of the farm which provides animals for the experimental work.

—D. D. OGILVIE.

ALGERIA. (1941). Rapport sur le fonctionnement de l'Institut Pasteur d'Algérie en 1940. **[Report of the Work of the Pasteur Institute, Algeria, during 1940].** [SERGENT, Ed.]—*Arch. Inst. Pasteur Alger.* **19.** 366–403. **1656**

Work of veterinary interest is as follows. Research on RICKETTSIAL INFECTIONS established the existence of a development cycle in *R. conjunctivae* and *R. canis* [see abst. 1503]. *R. bovis*, enzootic in Algerian cattle was found to be transmissible to sheep [*V. B.* **10.** 834]. In the course of many years work on piroplasmosis, much has been learnt about ticks. The most common ticks in Algeria are *Ixodes ricinus*, *Haemaphysalis punctata*, *Hyalomma aegyptium*, *Rhipicephalus bursa*, *R. sanguineus* and *Margaropus calcaratus*. An attempt to transmit *Theileria dispar* among cattle by *Anopheles* mosquitoes failed. Between 1933 and 1939 19,000 cattle were premunized against piroplasmosis. The discovery of pig typhus [*V. B.* **10.** 691] is mentioned.

The statistical section of the report gives figures for routine diagnosis and biological product preparation. Enough vaccine to immunize 2,636 dogs against rabies was produced.

See also abst. **1485** (conference on rinderpest, British East Africa Territories).

BOOK REVIEWS

WRIGHT, A. E. [M.D., F.R.S., Principal of the Institute of Pathology and Research, St. Mary's Hospital, London]. (1943). **Studies on Immunisation. First Series.** pp. xi+421. Numerous figs., tables, charts. London: William Heinemann (Medical Books) Ltd. [4to] [25s.] **1657**

In this book articles published by the author between 1897 and 1908 are reprinted. The first half deals with the antibacterial elements of the blood fluids, and the second with therapeutic immunization.

Sir ALMROTH WRIGHT was one of the leading bacteriologists of his day and it is perhaps salutary for a modern research worker to glance at this book and to realize how quickly our concepts may become modified. As CLIFFORD ALBBUTT has said "It is the sacrifice of the scientific treatise to discharge its burden into the stream of knowledge and then to be itself consigned to the cockloft".

It is perhaps useful for the student of history to have these papers collected together, but when one realizes that the present volume is in all essentials a reprint of a book which appeared in 1909 there seems little reason to have reprinted these papers at the present time.—JOHN FRANCIS.

—. (1943). **The Chemical Formulary. A Collection of Valuable, Timely, Practical Commercial Formulae and Recipes for Making Thousands of Products in Many Fields of Industry. Volume VI.** [Edited by BENNETT, H.] pp. xx+636. Brooklyn, N.Y.: Chemical Publishing Co., Inc. [8vo] [$6.00]. **1658**

This is a comprehensive collection of formulae and recipes for making products of a widely diversified nature as the following selected chapter headings will show: "Adhesives", "Cosmetics and Drugs", "Emulsions", "Farm and Garden Specialities", "Hides, Leather and Fur", "Inks and Marking Materials", "Lubricants and Oils", "Metals, Alloys and their Treatment", "Soaps and Cleaners", "Rubber, Resins, Plastics and Waxes", and "Miscellaneous".

In all there are 22 chapters and the last one deals with "Substitutes" in which the products are listed in alphabetical order and opposite each is given one or more substitutes or alternative materials. At the end of the volume are given several very useful tables including weights and measures, approximate pH values for a number of substances such as acids, bases, foods, biological fluids, etc., and several conversion tables for units of volume, weight and energy, and for Fahrenheit and centigrade readings; a small list of buffer systems is also given. There is a good index, a list of useful reference books, and also alphabetical lists of chemicals and where to buy them in the U.S.A. The book is certainly a mine of general information in this particular field.—R. A.

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